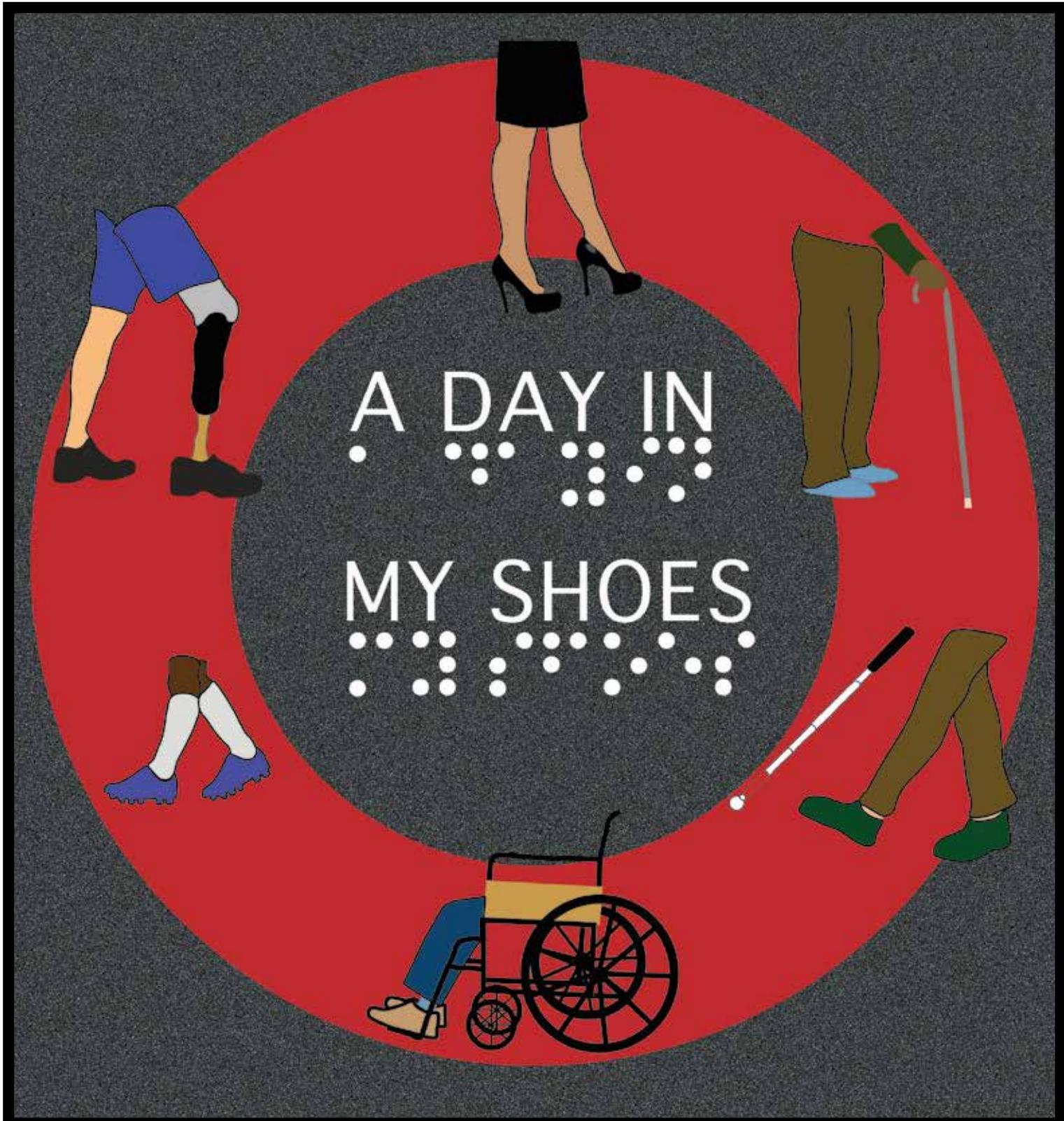


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Journal of the Society for Technical Communication





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Journal of the Society for Technical Communication

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Technical Communication (ISSN 0049-3155, permit 0763-740) is published quarterly by the Society for Technical Communication, a nonprofit educational organization, 9401 Lee Highway, Suite 300, Fairfax, VA 22031-1803, USA. All rights reserved. Copyright © 2016 by Society for Technical Communication. Periodicals postage paid at Fairfax, VA 22030, USA, and at additional mailing offices. Canada Post Agreement Number 40045946. Send change of address information and blocks of undeliverable copies to P.O. 1051, Fort Erie, ON L2A 6C7, Canada.

POSTMASTER: Send address changes to *Technical Communication*, 9401 Lee Highway, Suite 300, Fairfax, VA 22031-1803, USA. Printed in the USA.

CHANGES OF ADDRESS AND CORRESPONDENCE: Notification of change of address for both STC members and nonmember subscribers should be sent to the STC office. Nonmember subscription rates (print version): \$400 USD per year, \$420 USD in Canada, (\$440 USD overseas). Individual issues may be purchased from the Society office for \$40 while supplies last.

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Liz Herman



MY NAME IS LIZ HERMAN AND

I'M AN STC MEMBER

Technical COMMUNICATION

AUGUST 2016

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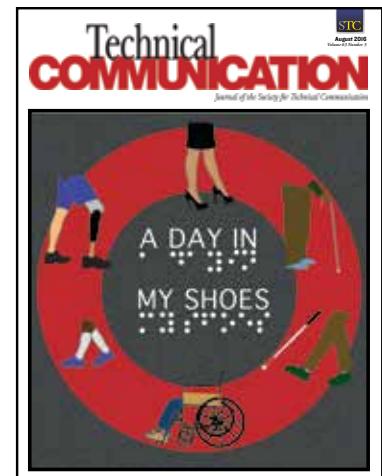
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About the Journal

Technical Communication is a peer-reviewed, quarterly journal published by the Society for Technical Communication (STC). It is aimed at an audience of technical communication practitioners and academics. The journal's goal is to contribute to the body of knowledge of the field of technical communication from a multidisciplinary perspective, with special emphasis on the combination of academic rigor and practical relevance.

Technical Communication publishes articles in five categories:

- **Applied research** – reports of practically relevant (empirical or analytical) research
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The purpose of *Technical Communication* is to inform, not impress. Write in a clear, informal style, avoiding jargon and acronyms. Use the first person and active voice. Avoid language that might be considered sexist, and write with the journal's international audience in mind.

Our authority on spelling and usage is *The American Heritage Dictionary*, 4th edition; on punctuation, format, and citation style, the *Publication Manual of the American Psychological Association*, 6th edition.

Manuscript Preparation and Submission

Submitting a manuscript to *Technical Communication* for review and possible publication implies that its submission has been approved by all authors, researchers, and/or organizations involved, that the manuscript (or a substantial portion) has

not been published before, and that the manuscript is not under review elsewhere.

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- Page 3: Up to five keywords and a practitioner's takeaway (maximum 100 words) displayed as a bulleted list summarizing the practical implications of the article
- Page 4: Start of the manuscript
- References
- Tables and figures – Start each table or figure on a new page. If a manuscript is accepted for publication, provide high-resolution images.

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Sam Dragga, Editor



The Journey of Ideas

The articles in this issue of the journal tackle important subjects of the field, but each also has a history that is important and instructive, indicative of the journey of ideas to the published page.

Ideas for research projects come from lots of directions and sources and evolve through a unique mix of education and experience, extensive reading, creativity, persistent analysis, conversations with colleagues, meticulous attention to annoying details, and the right inspiration at the right time. As I speak to prospective authors about their projects or discuss with authors the manuscripts accepted for publication, I am always interested in the origin stories of their manuscripts.

The four articles in this issue of the journal are four impressive journeys.

Tina Kister's "Improving the Information Development Process: A Refined Iterative Development Model" is a comprehensive review that generates important new thinking. Writing as a project manager, Tina examines scores of development models across a wide array of industries and identifies defining characteristics and stages. The findings of this systematic analysis are the foundation on which she composes a flexible but rigorous process that integrates iterative efforts of progressive elaboration, feedback, and validation as well as specific stages directed to innovation, efficiency, and completion.

This article was originally a presentation that I caught at the 2015 STC Summit in Columbus. I was impressed with the wide scope, practical focus, and solid research basis of the project and encouraged Tina to consider adapting the presentation for publication in the journal. I later queried Tina about the perspective she brings to this project, and she was pleased to explain it:

My career path has been unconventional, because I've worked as a professional information developer for about 16 years but only entered a traditional corporate environment in 2011. In many ways, I was very naïve. As an entrepreneur, and having worked within smaller groups of people (20–30), I was always focused solely on the quality of the work (process and product).

I actually didn't even know that "project management" was a thing. I had managed large and small projects with groups of people spread all across the country. I had been a small-business owner, managing schedules, clients, payroll, etc. Regardless of the setting, my focus had always been on the final outcome. For example, while I would break a large project into smaller segments, anticipate problems, and base the work on deadlines, I never

thought of it as creating a "work-breakdown structure," managing an "event chain," or making a "backward pass." I just did what needed to be done—what made sense.

On entering the corporate world for the first time, things didn't make sense. We were delivering low-quality work in order to comply with bloated corporate policies and negotiate corporate politics. My colleagues were confused and demoralized. As a former business owner, it was excruciating to watch the company bleed money due to wasted resources, lost talent, poor processes, and downright dishonesty.

So, being a generally curious and proactive person, I decided to dive in and learn about communicating "best practices" in a language that my new colleagues could understand. As I continued to work in the corporate world, it became clear that the visual nature of development models provide an excellent starting point for discovering the more complex processes that lead to healthy development.

Tina also detailed the challenges of writing and revising for publication:

My biggest challenge in writing the article was finding a way to articulate ideas that seem obvious to me and to do so in ways that resonate with technical communicators. I think this is important, because that's often what technical communicators must do to create quality information products—we have to work with experts who are so well-versed in a particular area that it's difficult for them to identify and express the assumptions, shortcuts, and previous experiences that provide the foundation for their expertise.

It was (and is) very difficult for me to be aware of my own assumptions, shortcuts, and previous experiences, and to translate them into language that is meaningful. For example, because I have spent a lot of my life making furniture, building sheds, laying tile, and doing other hands-on work, I tend to make analogies between information-development processes and building things. At the STC Summit in 2015, I presented this same information and tried to create an analogy between the preparation phase in the model and creating a jig for a table saw so that you can quickly repeat standardized cuts. (I think it's safe to say that the analogy was generally ineffective.) While I'm pretty

good at getting other people to reveal what seems obvious to them, it's a constant challenge to identify and articulate what seems obvious to me.

Brian Ballentine's "Using Process Modeling Notation to Map the Buying and Selling of Complex Software Solutions: A Qualitative Study's Implications for Practice and Pedagogy" examines a subject that is a point of disjunction for academic instruction and on-the-job practice. Using a rhetorical analysis of materials developed for a client, Brian considers the activity network diagrams widely taught in research methods courses versus the standard process modeling notation used in government and industry. As Brian explains, a client project initiated this journey of ideas:

The Vice President that I was working with more or less insisted that I explore process modeling notation. She was less than happy with my initial attempts at data and workflow visualizations, and she wondered why I wasn't using technology that supported open standards. I hadn't used process modeling in at least 10–15 years (when I worked in industry as a software engineer). The VP seemed almost alarmed that I didn't default to using an open standard, so I took her feedback quite seriously.

He also noticed a glaring inattention in the field to this subject:

Process modeling gets minimal discussion in TC journals even

though notable members of the field like Jackie Damrau have identified its rising importance. There has been more discussion lately (on TC listservs) about the rise of Business Analyst positions and their overlap with TC jobs. A basic understanding of process modeling notation is important, so practitioners can participate and/or compete for these jobs.

A key challenge for Brian was designing a representative but instructive illustration:

In an article discussing the importance of process modeling I had to offer at least one model, so readers had a basic understanding of what something like BPMN can do. I am by no means an expert, and it is likely that a business analyst would correct my 'grammar' in the visualization in order to make it more efficient. I chose to include the model that I did because I wanted to emphasize that with a limited time investment (and the use of free, open source tools), someone can get a draft of a model ready to show. It isn't perfect, but a practitioner or academic could get started and/or contribute to a conversation in short order.

Like Tina Kister's manuscript, Brian's project also enjoyed early life as a conference presentation:

I gave an early presentation on working with Business Process Modeling Notation (BPMN)

Sam Dragga, Editor

and the importance of working with open standards at the *International Writing Research Across Borders* conference in Paris in February of 2014 and an updated presentation on the data visualization at the *4th Annual Symposium on Communicating Complex Information* run by Mike Albers at East Carolina University. Both presentations (and feedback from Kirk St. Amant as well as outside reviewers) helped me reshape the piece.

Two years and several revisions later, the idea emerging from a project for a client is the published article in this issue.

Baotong Gu and Meng Yu's "East Meets West on Flat Design: The Convergence and Divergence in Chinese and American User Interface Design" investigates the shift from the previously ubiquitous skeumorphic (or mimetic) icons and images to the flat (or abstract) illustrations that dominate user interfaces across almost all devices at this time. Using examples from China and the United States for clarity and emphasis, Baotong and Meng consider the social, rhetorical, cultural and ideological influences on user interface design and find merit in the skeuomorphic, the flat, and the integration of the two. Their advice is to allow cultural sensitivity to guide the choice of design.

After accepting this manuscript for publication, I inquired about their source of inspiration. Baotong and Meng identified it as a recognition of the importance of

their subject and a desire to assist the field in addressing it:

User interface design is one of the most important topics in technical communication, especially in this digital age where UX design is at the forefront of technical communication design. Of particular interest to technical communicators are cross-cultural aspects of interface design intended for a global audience. The convergence and divergence in user interface design approaches over the last few decades warrants a close examination of what cultural factors are at play in the shifting trends. But one of the greatest challenges in writing this article was translating our theoretical conclusions about user interface design into operationalized guidance for practitioners. We do take satisfaction in arriving at some practical advice that we hope will be helpful to our field.

I also asked about their choice of illustrations—key evidence for their claims—and appreciated their candid answer:

There are obviously millions of user interface design examples available out there. Selecting samples representative of both the American and Chinese cultures wasn't an easy task. We did agonize over selecting the most illustrative and representative samples without being prejudiced for or against any of them. We started with hundreds of

possible sample designs and decided on the ones we used after much deliberation and careful assessment. We're glad with what we used and hope they illustrate well what we theorized about user interface design in different cultural contexts.

Claire Lauer and Eva Brumberger's "Technical Communication as User Experience in a Broadening Industry Landscape" builds on their article in the November 2015 issue of the journal ("The Evolution of Technical Communication: An Analysis of Industry Job Postings"). This new article focuses on 502 industry job postings for user experience specialists, identifies the necessary skills and abilities of appropriate candidates, determines that technical communicators are especially equipped for this growing field, and addresses the challenges for individuals and academic programs in making the transition.

This was a project inspired by their earlier project but also by their awareness of the rising activity and influence of UX. As Claire and Eva explain,

We got interested in the subject for two reasons. One being that when we conducted our initial study of technical communication jobs, many of the jobs that came up were UX jobs, and these jobs shared a great many qualities with the jobs for which we were already preparing technical communication graduates. But even before that, we had been

interested in the continued expansion of tech comm and the inclusion of UX as a viable area of expansion within the field.

We appreciated that UX was centrally about attending to audience, which is a strength that is also absolutely central to the work of technical communicators. Additionally, we have also focused our research agendas on issues of visual communication, visual literacy, and multimodal composing. Visual, Web, and multimodal texts are where UX work is most visible, so it was naturally an area to which we were attracted. In this way, UX is a synthesis of all the best parts of being a technical communicator: audience, research, design, content.

Claire and Eva also note that the project offered challenges that were mitigated by collaboration:

The greatest challenge in writing the article was by far the time it took to code the hundreds of job ads. Because of the versatility of language (i.e., the ability to describe one competency or characteristic in many different ways using many

different terms and phrases), we had to closely comb through each job ad and code it for the dozens of competencies and characteristics we were looking for. The research and writing of the article went fairly quickly compared to the collecting, coding, analysis, and visualizing of the data.

We didn't exactly know what we were going to find when we started, so we had to remain flexible and ready to expand, yet not expand so far out as to make the data collection unmanageable. But we greatly benefitted by working as a pair because we were able to brainstorm ideas thoroughly, vet approaches and methods, and more broadly determine the paths we would take. We also benefitted working as a pair by being able to embed interrater-reliability in our coding and analysis.

The origin stories of the four articles here give voice to the human beings who have navigated the rapids of research and writing to bring their ideas to this journal.

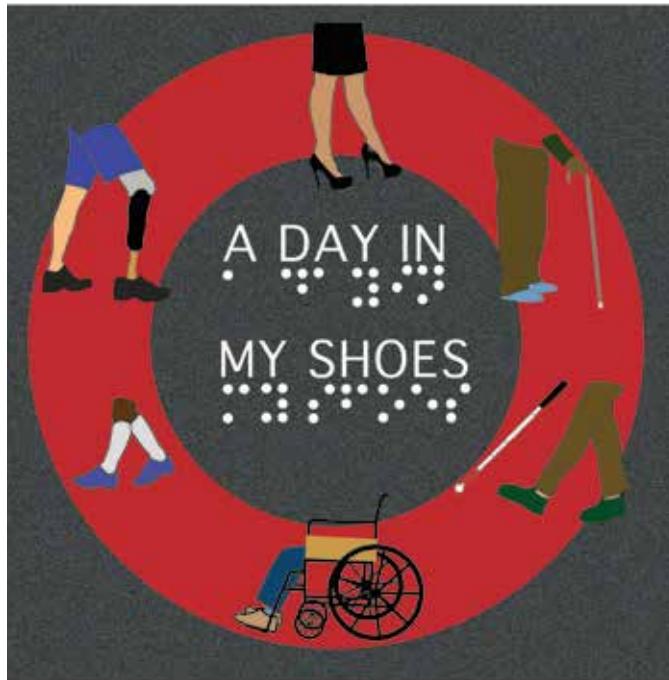
I am proud, and STC subscribers ought to be proud of the human-centered submission process

this journal uses to greet the authors who bring us their ideas: authors attach their files to a simple email message addressed to tceditor@stc.org, and I answer. I believe that authors submitting manuscripts—manuscripts that might be years in the making, manuscripts in which professional identities are invested, to which irreplaceable time and effort are committed—deserve to pass their manuscripts to a living human being who replies with a sincere message of appreciation.

We also ought to be proud of the 30-day review cycle that this journal offers: Authors submitting their manuscripts deserve a timely review. I ask reviewers for comments in 30 days and, though the deadline slips from time to time, reviewers are typically on time and nevertheless generous with their perceptive advice. In the age of digital manuscripts and email, review periods of 60, 90, 120 days are unnecessary and inappropriate for this field.

As technical communicators assure that technology is designed for the human beings using it, I believe this journal must also make sure that it is designed for its contributors as well as its subscribers and that the humanity of writers and readers is always conspicuous in the journey of ideas.

On the Cover



The people are making their way in a circle to represent the spectrum of abilities, backgrounds, and races that exist in today's society. They symbolize people of differing ability who may encounter difficulties with accessibility.

The red circle is indicative of the *no* symbol, most commonly used as a prohibition sign. The version that I have depicted is missing the slash in the middle, meaning there are no boundaries or limitations.

I chose to sum up the message of my image with the words "A day in my shoes" to provoke thoughts about how our privileges allow us certain advantages while our weaknesses prevent us from achieving some of our goals. Including this phrase in braille was important to bring across the message that people communicate in different ways, and we need to accommodate people's needs at a societal level.

About the Artist

As an undergraduate student in the Roy H. Park School of Communications at Ithaca College, **Ella Sciocchetti** is studying Integrated Marketing Communications. This Bachelor of Science degree encompasses advertising, public relations, and marketing. Ella is passionate about promoting causes and spreading positive messages in her designs. She is available at Esciocc1@ithaca.edu.

Improving the Information Development Process: A Refined Iterative Development Model

By Tina M. Kister, Nanatoo Communications, LLC

Abstract

Purpose: This article presents a refined iterative development model that may be used to improve the processes related to information development. Specifically, the model is designed to facilitate rapid and incremental delivery and increased quality and efficiency.

Method: The refined iterative development model is based on an analysis of models from across a range of industries. The analysis was designed to clearly define what a development model is, the basic phases it contains, and various common uses. The approach to this project was from the perspective of a practicing technical communication professional and project manager.

Results: The analysis revealed that development models are visual, conceptual, representational, process-oriented, inventive, and both sequential and iterative. The basic phases common to development models are, generally speaking, Discovery, Planning, Implementation, Review, Refinement, and Release (or Deployment). Common uses include sharing knowledge, facilitating success, enhancing credibility, and demonstrating progress.

Conclusion: The analysis and comparison allows for a deeper understanding of what a development model is and how a refined iterative development model can be used to improve processes related to information development.

Practitioner's Takeaway:

- The proposed refined iterative development model is designed to facilitate rapid and incremental delivery and increased quality and efficiency through adequate planning and preparation.
- The refined iterative development model includes three distinct types of iteration: Progressive Elaboration, Feedback, and Validation.
- The refined iterative development model includes three new phases: Synthesis (designed to facilitate innovation), Preparation (designed to facilitate quality and efficiency), and Delivery (designed to facilitate closing processes and to definitively end the project).
- Successfully implementing the model requires taking an expert-level approach, understanding the intent and assumptions of the model, adopting an overall vision of success, getting started to create impetus, documenting and communicating the model, and closing the gaps between the processes outlined by the model and actual processes in use.

Introduction

Professional communicators have many tools and systems that can be used to improve the processes related to information development, such as standards (style guidelines), templates, terminology lists, content repositories, process documentation, and more. One such tool is a development model.

The purpose of this article is to introduce a refined iterative development model for information development—a model that can be applied in a business setting to meet fundamental business goals, such as increased productivity and overall profit. The proposed model is designed to allow for both rapid and incremental delivery and for increased quality and efficiency through adequate planning and preparation.

Because iteration is a very important aspect of development (as discussed in detail later), the proposed refined development model specifies three distinct types of iteration (Progressive Elaboration, Feedback, and Validation). The model also includes three new phases: Synthesis (designed to allow for innovation), Preparation (designed to both increase the overall quality of the final deliverable and to improve efficiency during the Implementation phase), and Delivery (designed to facilitate closing processes and definitively end the project).

Approach

My approach to this project was from the perspective of a practicing technical communication professional and project manager, rather than an academic. Many managers base important strategic business decisions on trends as they are presented in mass media, rather than on in-depth scholarly research; therefore, the development models analyzed consisted primarily of those found in non-scholarly sources, such as Google.

My decision to focus on non-scholarly sources is an intentional reflection of the position in which many technical communicators find themselves, in which the people who make decisions regarding the information development process are not academics and, often, are not even trained or experienced technical communicators. Instead, they may be program managers, engineers, software developers, marketing managers, or professionals with other areas of expertise. While often concerned and conscientious, they are not likely to have the time,

resources, or opportunity to dive into sometimes-obscure academic texts.

Methods

The first step I took was to carefully analyze several existing development models from a wide range of industries. My goal in this analysis was to more thoroughly understand exactly what a development model is and to formulate a clear definition for the purpose of this article. I analyzed more than 50 models from across a range of industries, including health care, instructional design, industrial design, manufacturing, employee retention, user-centered design, software development, building construction, science, engineering, process improvement, Web design, content strategy, conflict resolution, land management, quality assurance, project management, business analysis, and marketing.

I qualitatively assessed each model against a list of simple descriptive terms suggested by the models themselves—terms such as *visual*, *conceptual*, *complex*, and *sequential*. The process was a simple, systematic form of descriptive classification based on common dictionary definitions. (See Saldaña, 2009, pp. 70–73 for a discussion of descriptive coding.) The purpose of this assessment was to progressively narrow the definition of *development model* and to distinguish development models from other types of models. The results of this analysis are discussed in the Defining A Development Model section of this article. The analysis was both a process of discovery and a process of refinement; if a term did not apply to any of the models, then I discarded it. (This analysis was a form of progressive elaboration, which is discussed in detail later in this article.)

I also referred to scholarly (peer-reviewed) sources in an attempt to better understand the history and intent of specific models and how and why models are important in a development setting. I also searched for previously published development models specific to the information development process, such as the model of the information design process, published by J.C. Redish in 2000 (Figure 1).

My sources included Google Scholar and the online academic library at the University of Florida (George A. Smathers Libraries). Within the Smathers Libraries, I used search tools such as WorldCat, EBSCOhost, ingentaconnect, and JSTOR. My searches were conducted between November 2014 and April 2015.

A Refined Iterative Development Model

Defining a Development Model

The analysis of models across industries allowed me to articulate what a development model is for the purpose of this article and to distinguish development models from

other types of models. The following sections outline some of the characteristics, phases, and uses that are common to development models across industries. These, in turn, provided a foundation for the refined iterative development model presented later in this article.

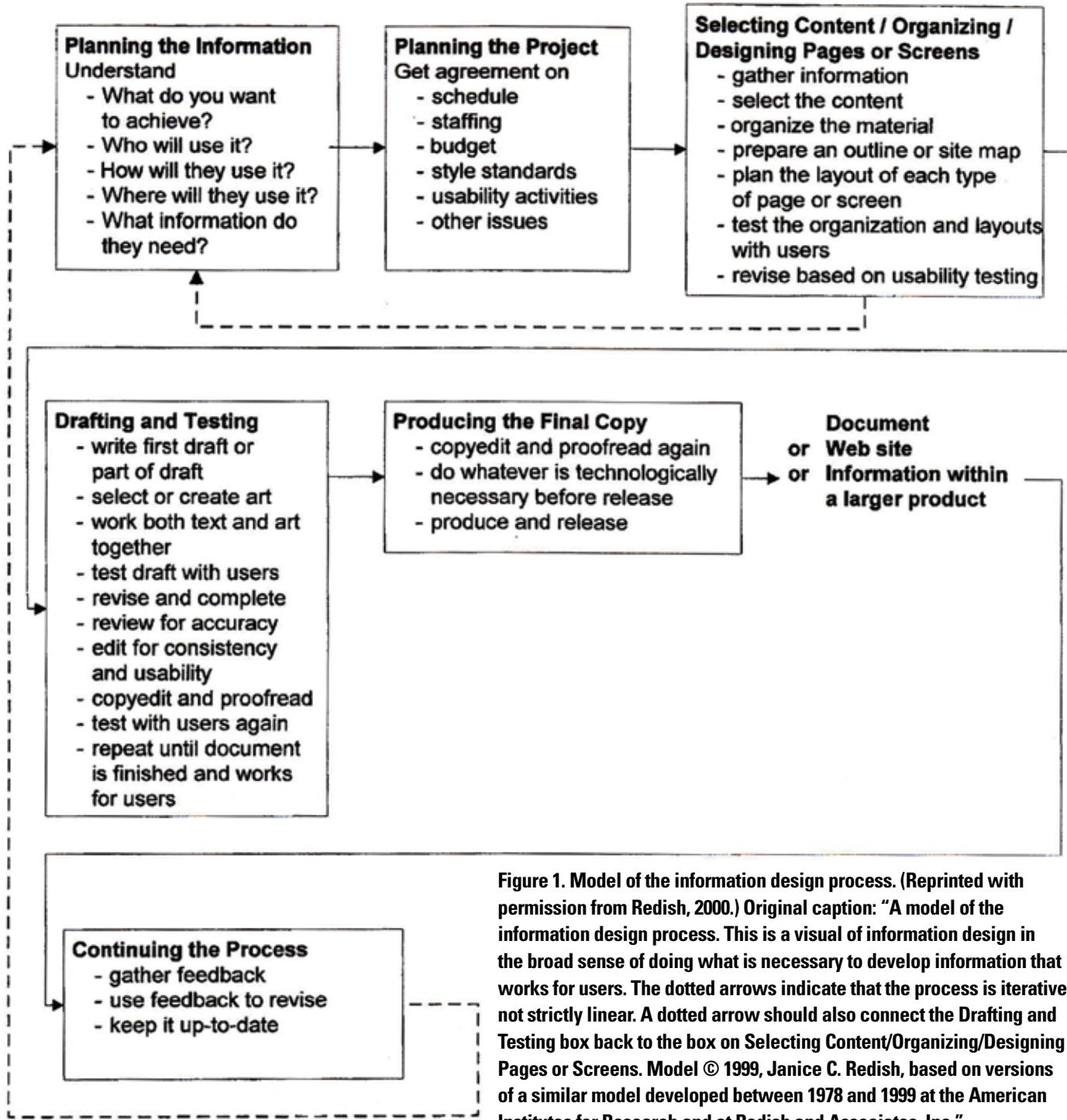


Figure 1. Model of the information design process. (Reprinted with permission from Redish, 2000.) Original caption: "A model of the information design process. This is a visual of information design in the broad sense of doing what is necessary to develop information that works for users. The dotted arrows indicate that the process is iterative, not strictly linear. A dotted arrow should also connect the Drafting and Testing box back to the box on Selecting Content/Organizing/Designing Pages or Screens. Model © 1999, Janice C. Redish, based on versions of a similar model developed between 1978 and 1999 at the American Institutes for Research and at Redish and Associates, Inc."

Common characteristics

The word *model* is used broadly across industries, and can refer to a wide range of tools, from three-dimensional objects (in architecture, for example) to conceptual diagrams that use symbols and text, to product prototypes.

By examining models from a wide range of industries, it is possible to elucidate a few defining characteristics and to clarify what distinguishes a development model from other types of models. These characteristics are overlapping and interrelated. They are also cumulative, in that each of the characteristics listed below progressively narrows the definition.

The analysis revealed that development models are:

- Visual
- Conceptual
- Representational
- Process-oriented
- Inventive
- Sequential and iterative

Visual Most models are visual. While some models may be tactile, as well as visual (such as architectural models), development models are two-dimensional and rely on graphic elements to convey the interrelation of processes. While they can be described using text, the

concepts and relationships that they describe are more easily conveyed using graphic elements.

Some models, such as the Information Process Maturity Model (IPMM) developed by JoAnn Hackos and based on previous work to define “organizational maturity in the software industry” (Hackos, 2007, p. 33), are, perhaps, better described as matrices (that is, tabular displays of information in columns and rows). Interestingly, over time, these matrices are often simplified and presented as visual models in online sources (e.g., Geocent, n.d.). Such matrix-type models contribute valuable knowledge to our understanding of the processes and organizational structure related to information development. For the analysis described in this article, however, the term *model* is restricted to graphic representations and does not include such matrices.

Conceptual A conceptual model is a visual representation of abstract ideas that often focuses on the relationships between components of a system. In the natural sciences, for example, conceptual models are often used to show the relationships between different elements of an ecosystem (Figure 2). Like ecosystem models, development models visually represent the relationships among components of a system (a system focused on development).

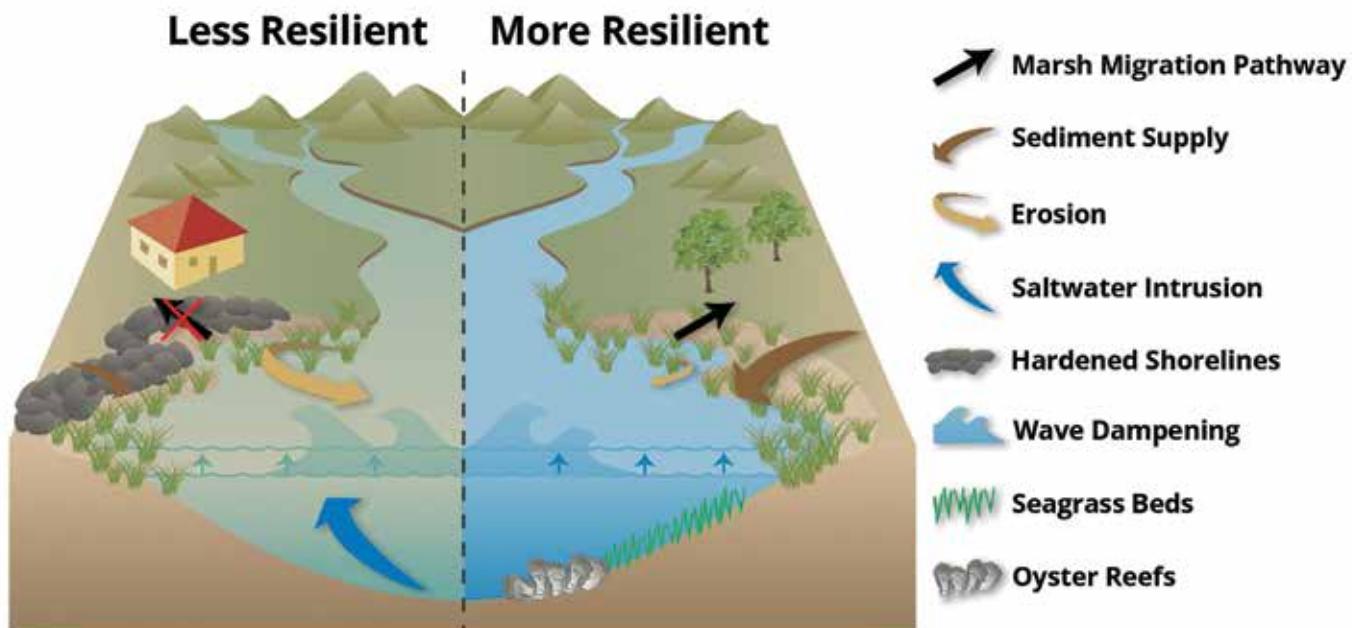


Figure 2. Coastal wetlands resilience. This model is a conceptual diagram showing the resilience of coastal ecosystems in the Chesapeake Bay. Conceptual models often focus on the relationships between components of a system. (Reprinted with permission from the Integration & Application Network, 2013.)

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Representational Models are also representational; that is, they depict an idealized state that is representative of an actual state. Development models are representational in the same way that art is representational. In painting and sculpture, *representational* refers to “images that are clearly recognizable for what they purport to be . . . such images need not be true to life” (Collins, n.d.).

This is an important concept that relates to the practical implementation of development models—because they are representational, they cannot be used as a literal step-by-step guide to daily practice. Instead, they can be used to guide the overall direction of a development process.

This concept is illustrated beautifully by mathematical models. A mathematical model of a parabola, for instance, may show an arc that perfectly models a statistical trend (Figure 3). However, if you examine the data points that are used to generate the arc, not all of the data points actually fall on the arc. This same concept relates to development models—while they are intended to describe the general shape of a development process, the detailed and daily steps that make up that process may not fall directly within the model.

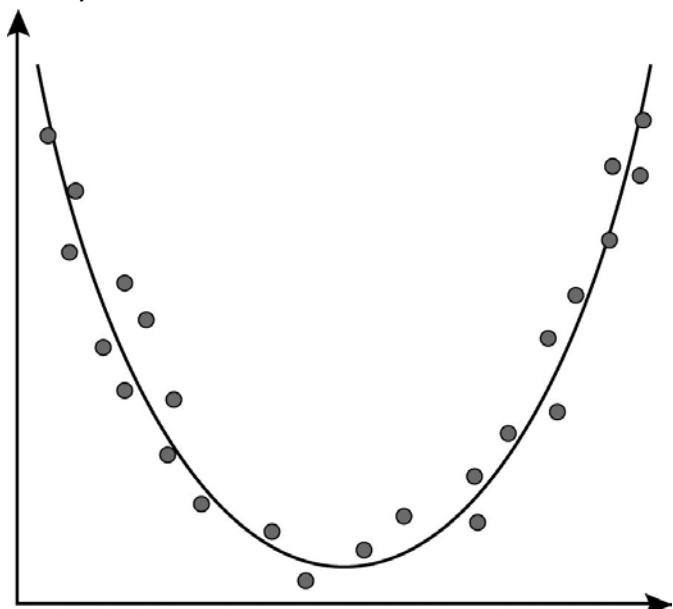


Figure 3. Mathematic model of a parabola. This mathematic model of a parabola is an example of how models are representational; that is, the specific data points that are used to generate the parabolic curve are not always on the curve itself. Similarly, development models are intended to describe the general shape of a development process.

Process-oriented Development models are also process-oriented. A process is a series of actions or steps taken to achieve a specific outcome. While most models show the interrelation of complex elements, not all models are related to processes. Competency models, for example, are primarily descriptive and show the relationship between different distinct attributes, or competencies, that are necessary to ensure professional success (Figure 4). While complex and interrelated, the competencies are not components of a process.

In contrast, process models, also called *business process models* and *process maps*, specifically describe a series of actions or steps designed to achieve a specific outcome, usually related to business operations. The term *business operations* describes processes or workflows that are completed multiple times to achieve the same or a similar outcome, such as fulfilling an online order for a retail product. (See Object Management Group, n.d., for several examples of business process models.)

Inventive Like process models, development models depict a series of actions or steps that are taken to achieve a specific outcome. However, while process models show the steps involved in business operations, development models are inventive; they are specifically related to the design or creation of something new, such as a software application or a suite of training materials.

Sequential and iterative The important distinction that development models are inventive leads to another defining characteristic of development models: They are both sequential and iterative.

According to the characteristics defined to this point, process models depict a series of actions or steps taken to achieve a specific outcome. They are also sequential because the actions or steps are performed in a specific order. However, while process models are sequential, they are not always iterative; that is, they do not necessarily include a repetition of steps that leads to improvement.

Development models, in contrast, do include a repetition of steps that leads to iterative improvement: “Iteration is a fundamental of good design” (Hasso Plattner Institute of Design at Stanford, n.d., p. 6). From a practical point of view, this makes sense: It is simply not possible to create something new that functions properly without some form of collaboration, prototyping, testing, validation, or other iterative process.

The iterative nature of development models is evident if we look more closely at two pairs

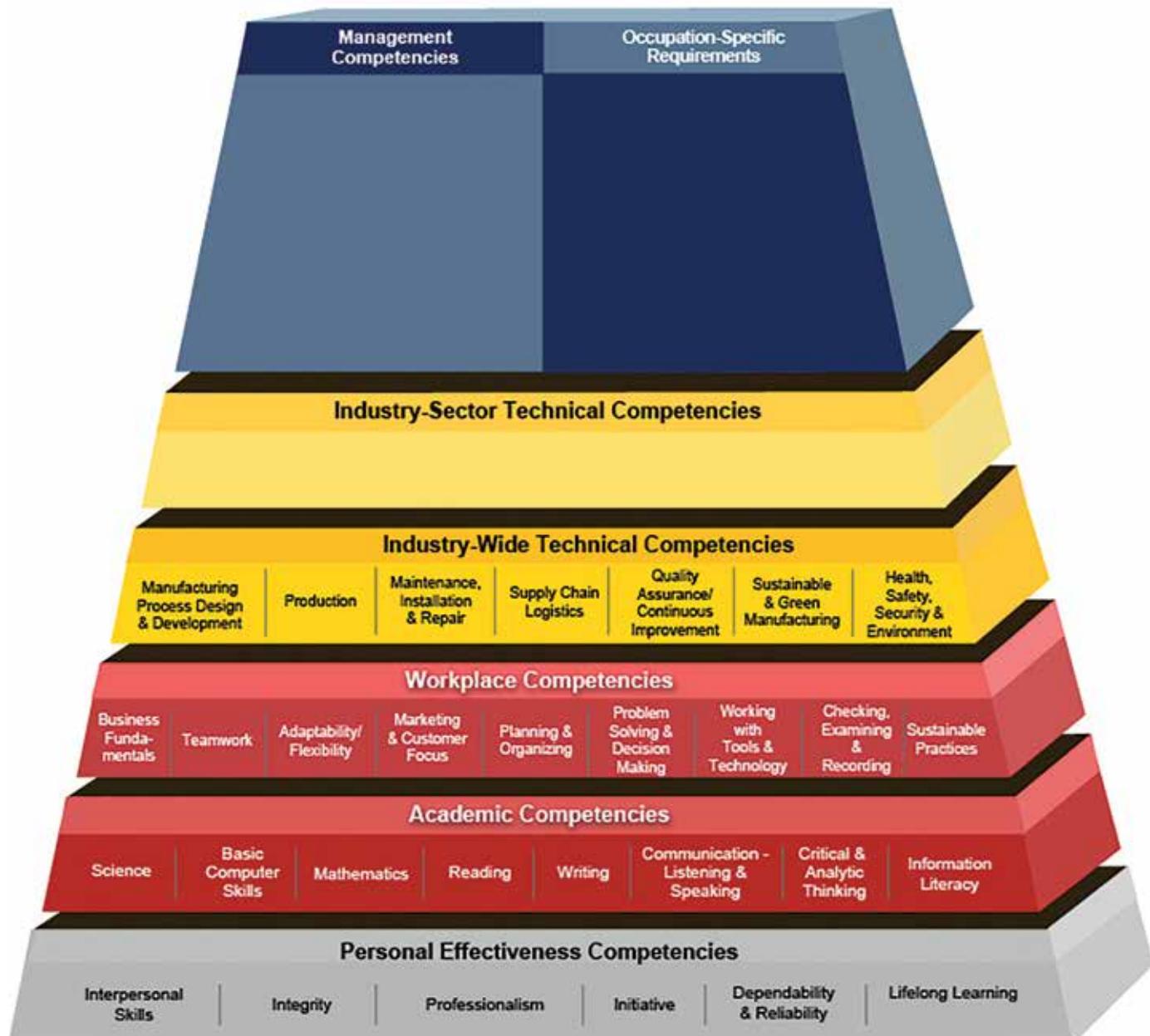


Figure 4. Advanced manufacturing competency model. This competency model is descriptive, rather than process-oriented, and shows the relationship between different distinct attributes, or competencies, that are necessary to ensure professional success. (Reprinted with permission from the U.S. Department of Labor, Employment and Training Administration, n.d.)

of development models in the fields of software development and instructional design.

These two pairs of development models are:

- Waterfall and Agile (in software development)
 - The Analyze, Design, Develop, Implement, Evaluate (ADDIE) model and the Successive Approximation Model (SAM; in instructional design)

In both fields, a newer model is presented as iterative and contrasted with an older model that is presented as purely sequential. This opposition is false—research into the origins of the older, so-called *sequential* models reveals that they are, in fact, highly iterative. The prevalence of these false oppositions also reveals the need for a deeper, expert-level understanding of what development models are and how they can be used.

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Waterfall and Agile In the field of software development, Waterfall is often characterized as rigid, cumbersome, risky, and entirely sequential (e.g., Base36, 2012; Chandler, 2012; Hughey, 2009; Mikoluk, 2013; Rasmusson, 2015). The typical visual representation of the Waterfall model shows a simple series of linear steps (Figure 5; e.g., Hughey, 2009; Ramsoft Consulting, 2004; Zelfond, 2013). At the same time, Agile is characterized as collaborative, flexible, and iterative (e.g., Base36, 2012; Chandler, 2012; Hughey, 2009; Mikoluk, 2013; Rasmusson 2015). The typical visual representation of the Agile model is explicitly iterative (Figure 6; e.g., GlobalTeckz, 2015; NextGeneration, 2013; Reich, 2012).

These characterizations are so common that, at the time this article was written, a Google search reveals several similar examples (e.g., Figure 7). However, research into the origins of the so-called *Waterfall* model (the source of the name is unclear) reveals that the authors often cited as the originators of the model described a highly iterative approach and

explicitly warned against a purely sequential approach (Benington, 1983; Royce, 1970).

The Waterfall model is often attributed to a group of software engineers working for the Department of Defense in the 1950s (e.g., Goodchild, 2012; Rabe, Spieckermann, & Wenzel, 2008; “Waterfall Model,” n.d.) and to a paper presented by Herbert D. Benington at a symposium on advanced programming methods in 1956 and republished in 1983. In the paper, Benington warns that attempting to “know precisely what our objectives are before we produce one line of code . . . can be terribly misleading and dangerous” (Benington, 1983, p. 352). However, many sources characterize Waterfall as “a linear approach” (Neelson, 2014, para. 5): “. . . for example, requirements must be reviewed and approved by the customer before design can begin” (Neelson, 2014, para. 7). In fact, Benington’s paper presents a highly iterative approach and explicitly acknowledges the need for iterative testing (Figure 8; 1983).

The first formal description of Waterfall is often cited as an article written by Winston W. Royce in

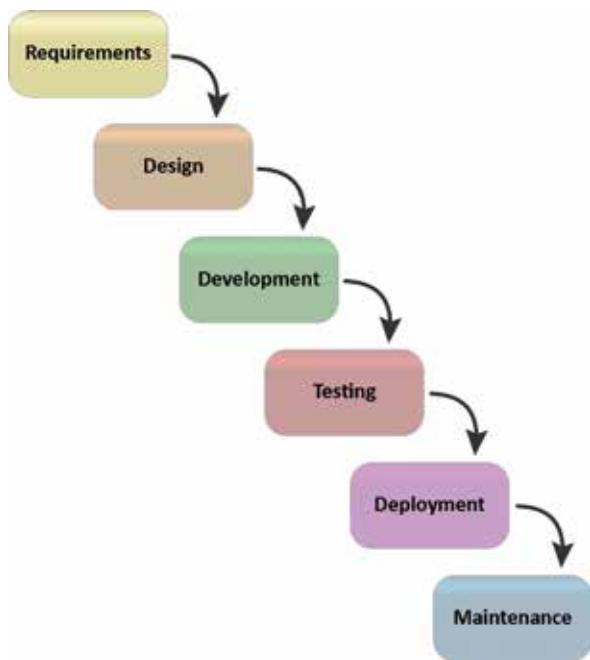


Figure 5. Waterfall model. A typical visual depiction of the Waterfall model shows a series of linear steps with no iteration. Waterfall is often characterized as rigid, cumbersome, risky, and entirely sequential (e.g., Ramsoft Consulting, 2004; Hughey, 2009; Mikoluk, 2013; Base36, 2012; Rasmusson, 2015; Chandler, 2012).



Figure 6. Agile model. A typical visual depiction of the Agile model shows a process that is explicitly iterative. Agile is often characterized as collaborative, flexible, and iterative (e.g., GlobalTeckz, 2015; NextGeneration, 2013; Reich, 2012). (Reprinted with permission from GlobalTeckz, 2015.)

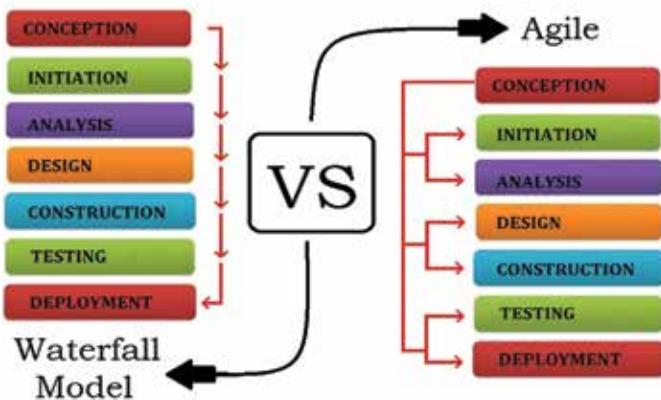


Figure 7. Waterfall and Agile models in opposition. The Waterfall and Agile models are often presented in opposition to one another. Waterfall is typically presented as a purely sequential process, while Agile is presented as explicitly iterative (e.g., Choudhury, 2012; Neo Globe Consulting, 2014; Reich, 2012). (Reprinted with permission from Choudhury, 2012.)

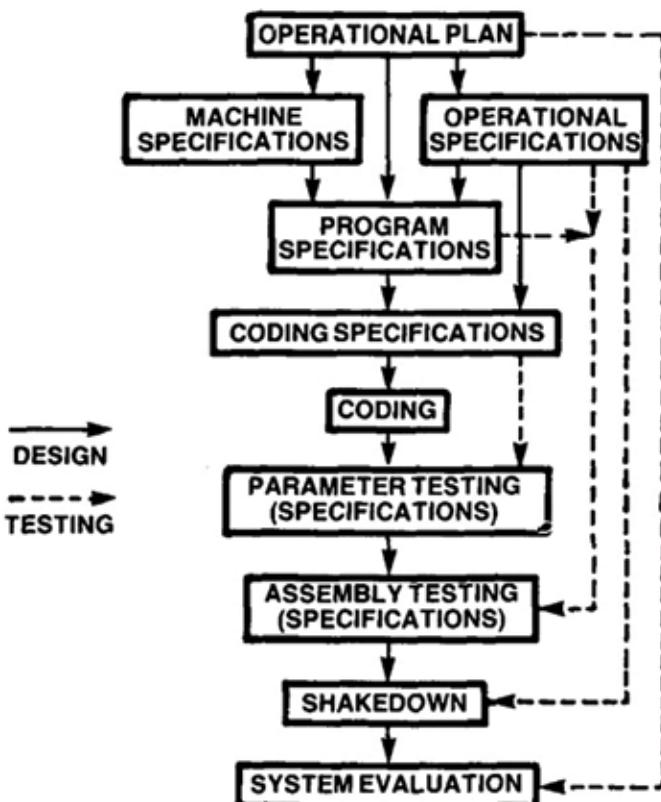


Figure 8. Benington's program production model. This visual depiction from Benington's article, which is often cited as one of the original sources of the Waterfall model (e.g., Goodchild, 2012; Rabe, Spieckermann, & Wenzel, 2008; "Waterfall Model", n.d.), includes steps that are explicitly iterative. (Reprinted with permission from Benington, 1983, p. 360.)

1970 (e.g., Cram, 2011; Ji & Sedano, 2011; "Waterfall Model," n.d.). Near the beginning of the article, Royce includes a model that resembles the typical visual representation of the Waterfall model, with a series of linear steps (Figure 9; Royce, 1970, p. 329). However, directly beneath the model, he writes, "... the implementation described above is risky and invites failure" (Royce, 1970, p. 329). He goes on to modify the model and explains that "The ordering of steps is based on the following concept: that as each step progresses and the design is further detailed, there is an iteration with the preceding and succeeding steps . . ." (Royce, 1970, p. 328). As the article continues, Royce elaborates on the model and, at the end of the article, presents the model that he recommends, which is visually complex and highly iterative (Figure 10; Royce, 1970, p. 338).

Despite what the original authors intended, Waterfall is almost universally characterized as purely sequential. This is important for two reasons: 1) It supports the premise that all development is, in fact, iterative, and 2) it exemplifies the need for a deeper understanding of the development process—by focusing on this false opposition, rather than on the iterative nature of all development, we fail to work toward more successful implementation of development models in daily work life.

ADDIE and SAM A similar opposition exists in the field of instructional design. The two models that are presented as oppositional are the ADDIE model (Figure 11) and the SAM (Figure 12). Typically, the visual representation of the older development model (ADDIE) is explicitly iterative (e.g., "ADDIE Model," n.d.; Chico State Instructional Design & Technology Society, n.d.; Clark, 1995; My Ed Tech Resource, n.d.). Despite the explicitly iterative representation, sources that promote SAM characterize ADDIE as requiring "perfectly executed giant steps" and as a "linear process" (Allen Interactions, 2015, para. 2). SAM is presented as a "different approach . . . that addresses the performance need through iterations, repeated small steps . . ." (Allen & Sites, 2012, para. 2).

Again, research into the roots of the ADDIE model, often attributed to educators working at the University of Florida in the 1970s (e.g., "ADDIE Model," n.d.; Clark, 1995; Juneau, 2013) reveals that the original model included several iterative steps. The ADDIE model is based on the Instructional Systems Development (ISD) model (Figure 13), which originally contained 5 general

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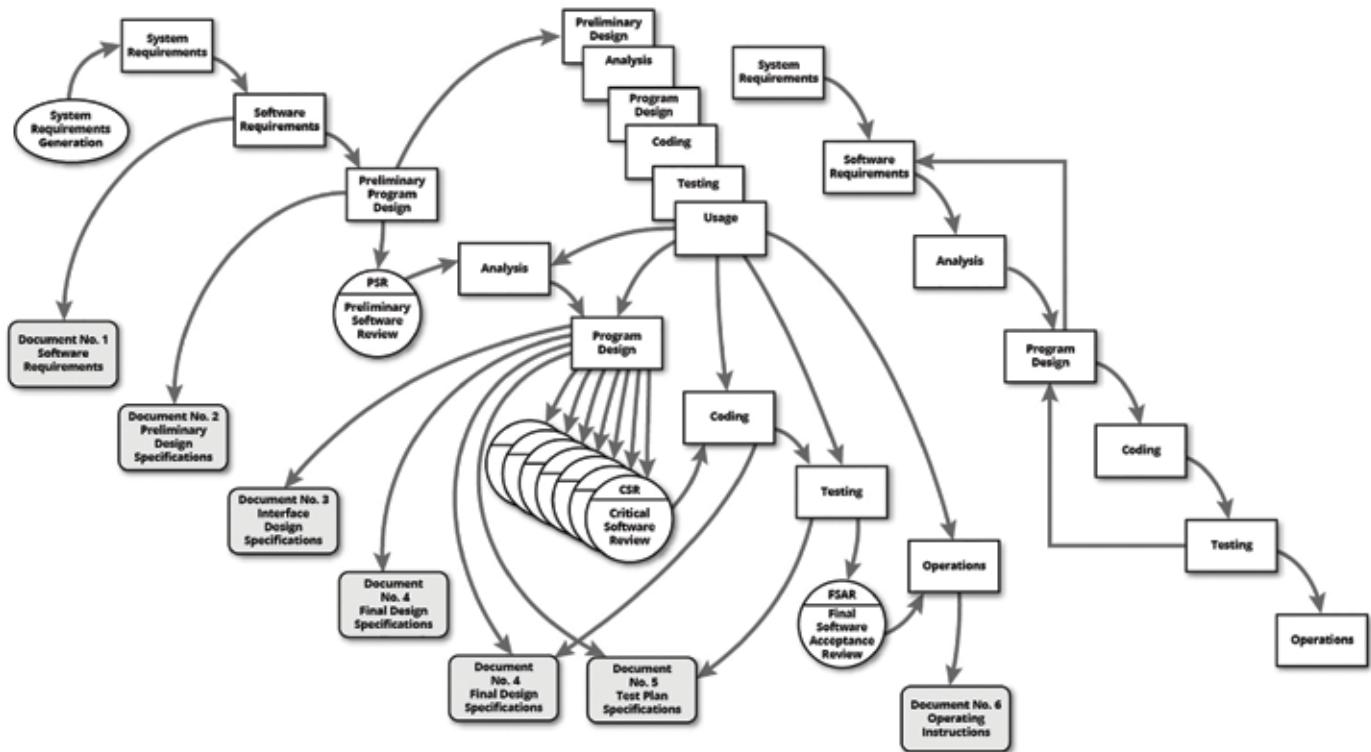
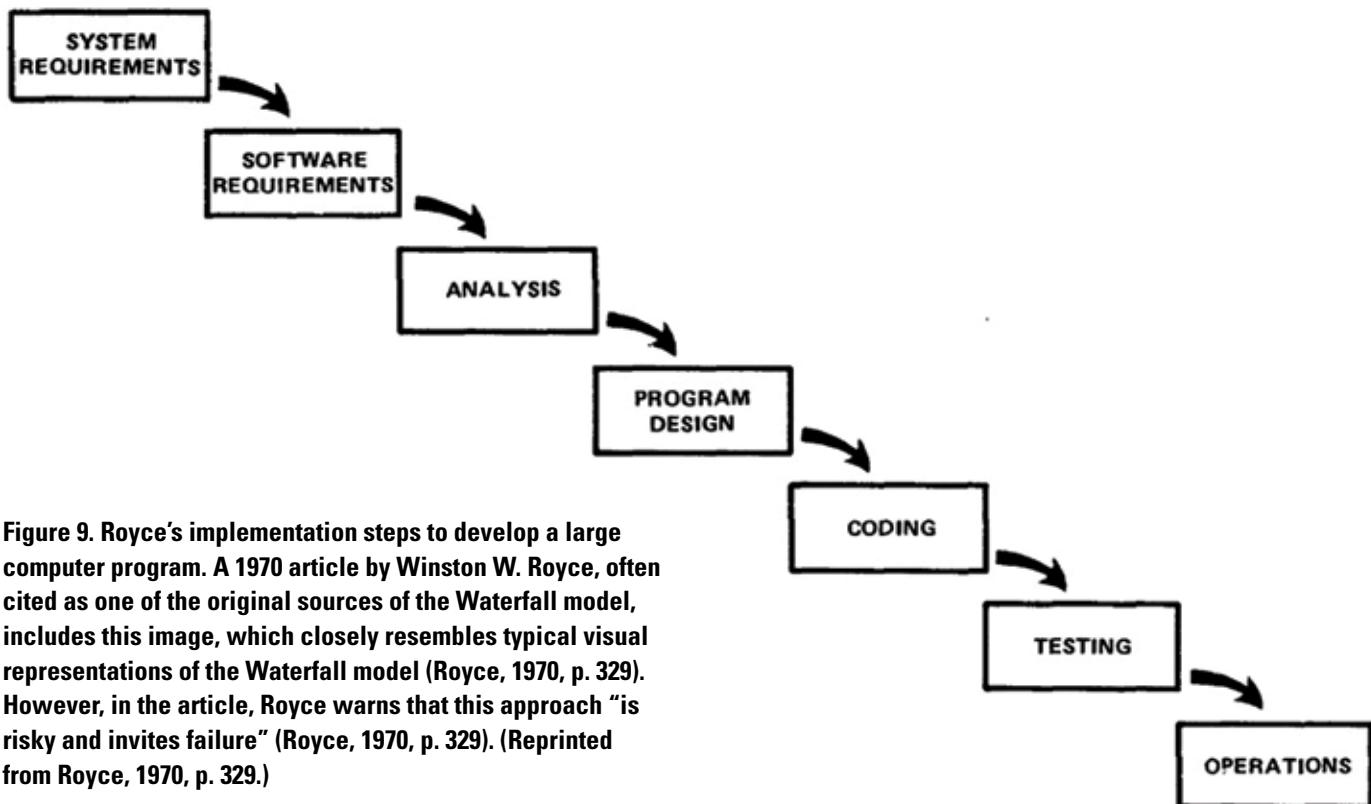


Figure 10. Royce's summary model. Royce's 1970 article ends with a model (p. 338) that summarizes the steps that he recommends "to transform a risky development process into one that will provide the desired product" (p. 335). The model is visually complex and highly iterative. (Reprinted from Royce, 1970, p. 329.)

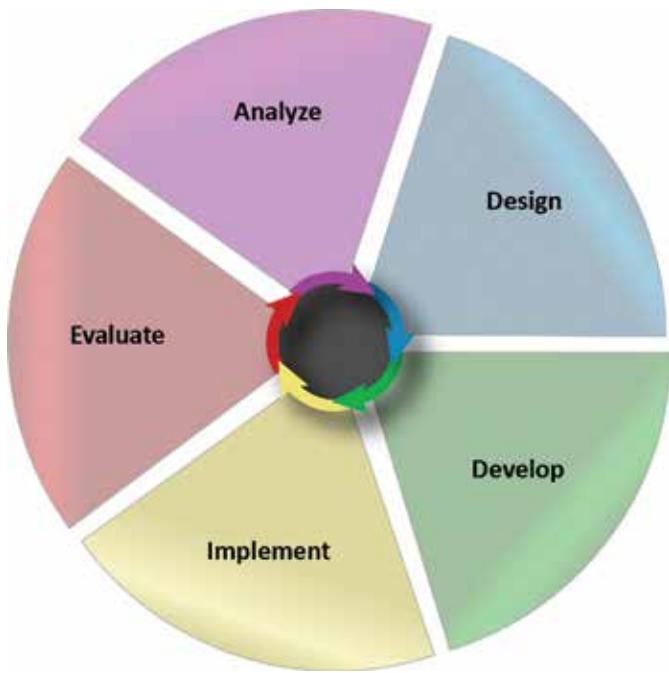


Figure 11. Analyze, Design, Develop, Implement, Evaluate (ADDIE) model. A typical visual depiction of the ADDIE model shows a process that is explicitly iterative (e.g., ADDIE Model, n.d.; Chico State Instructional Design & Technology Society, n.d.; Clark, 1995; My Ed Tech Resources, n.d.)

phases and 19 detailed steps, several of which call for iterative review and refinement (Branson, Rayner, Cox, Furmann, & King, 1975). While SAM may offer significant new ideas that improve the processes related to instructional design, in terms of iteration, it is not fundamentally different from the ADDIE model.

Summary To summarize, a deeper analysis of the false oppositions between Waterfall and Agile and between ADDIE and SAM suggests that the concept of iteration should be taken into account in formulating a refined development model for information development.

Some may find the idea of iteration alarming, believing that it adds to development time and, thus, expense. Those not familiar with the iterative nature of the creative process may wish to “get it right the first time,” so to speak. However, if “right” is already known—that is, if you have already determined what works and what doesn’t—then the process is not, in fact, an inventive (that is, development) process; instead, it is either a business process or production work.

The risk of unnecessary expense occurs when decision-makers do not understand the iterative nature of development and fail to plan for it. As most formally trained project managers agree, the later in the development process that issues (usually called *defects* in project management) are discovered, the more costly they are to remedy (Boehm & Vasili, 2005; Greene & Stellman, 2009). Factoring in the iterative nature of development ensures that projects can be proactively planned and that the healthy iterations that lead to improvement are seamlessly integrated into the project lifecycle.

The preceding analysis is a first step to understanding, at a fundamental level, what most development models have in common and, therefore, what a refined iterative development model should contain. Explicitly defining these characteristics provides

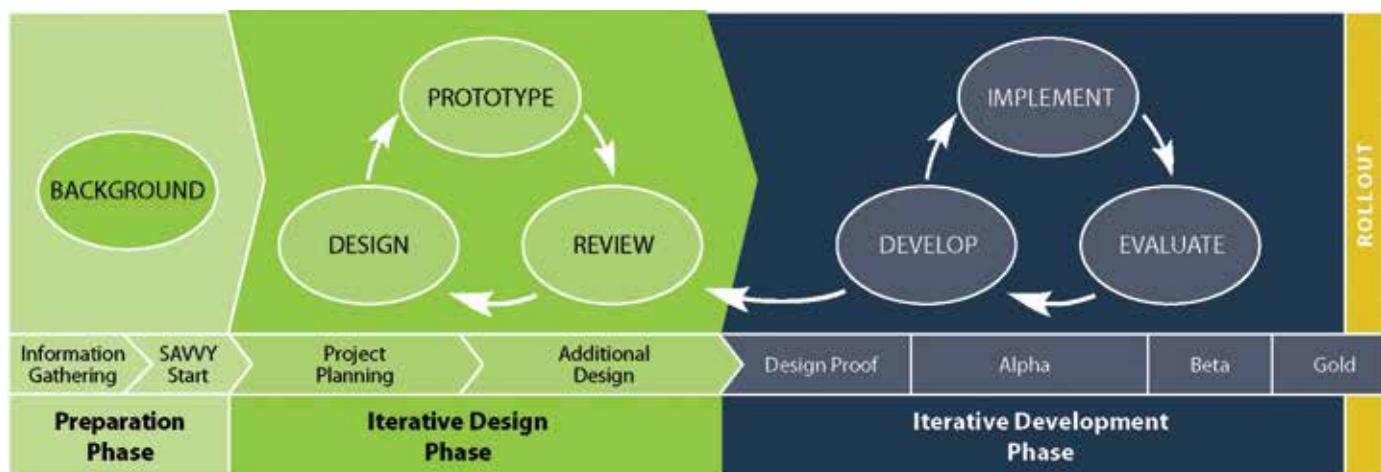


Figure 12. Successive Approximation Model (SAM). SAM is presented as a new, iterative alternative to the ADDIE model (Allen & Sites, 2012).

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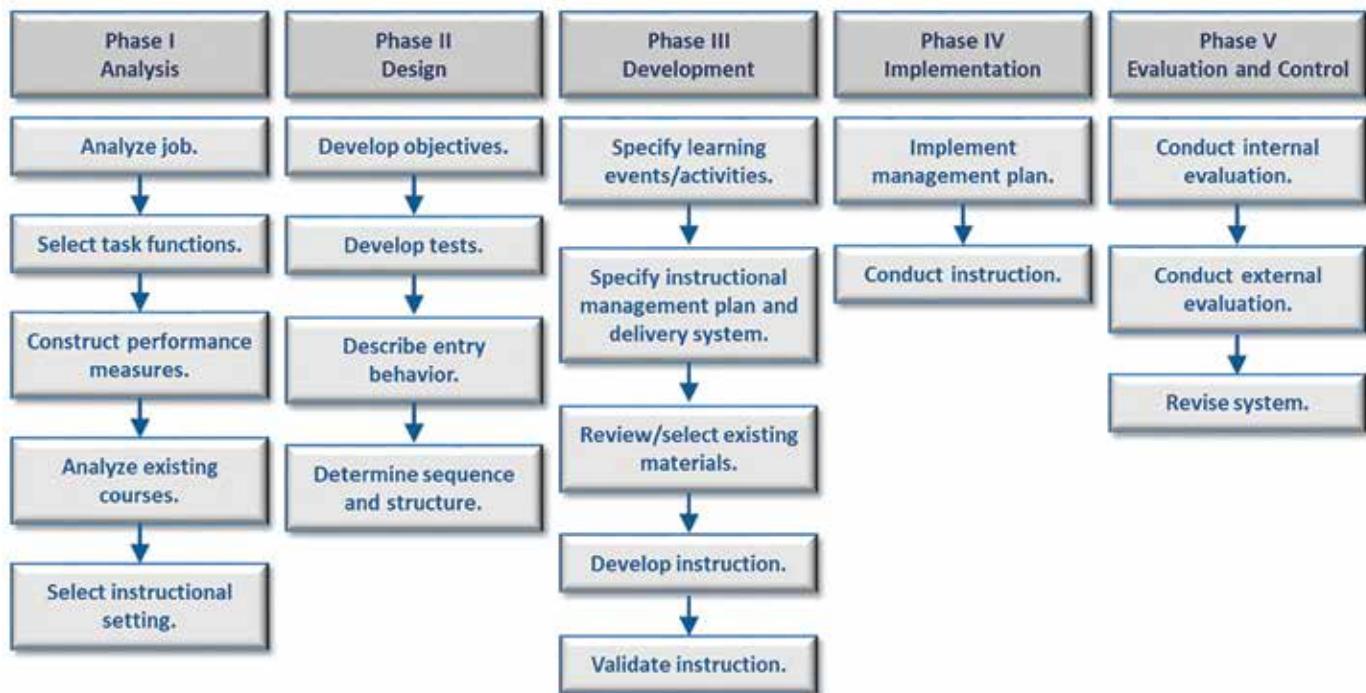


Figure 13. Instructional Systems Development (ISD) model. The ISD model, often cited as the origin of the ADDIE model (e.g., “ADDIE Model,” n.d.; Clark, 1995; Juneau, 2013), originally contained 5 general phases and 19 detailed steps, several of which call for iterative review and refinement. (Adapted from Branson et al., 1975. Reprinted with permission.)

a precise definition of what *development model* means in the context of this article and also provides a valuable framework for assessing the value of the proposed refined iterative development model and for adapting the model in the future.

The analysis demonstrates that development models are visual, in that imagery, rather than text, is best able to depict the complex relationships between steps. They are conceptual, in that they represent abstract ideas and relationships. They are representational, in that they depict an idealized state. They are process-oriented, because they depict a series of actions or steps. They are inventive, in that they are specifically related to the creation of something new. Finally, they are both sequential (outlining a series of actions or steps to be performed in a specific order) and iterative (requiring repetitive elements to ensure improvement).

Common basic phases

In addition to the descriptive characteristics outlined in the previous section, the analyzed models contain, essentially, the same basic phases. Development models are typically presented either as a series of steps or as a series of phases that contain detailed steps. While

each model may use different terminology, and many models do not clearly differentiate between each phase, the same basic phases are present. Hamilton describes the basic phases common to all development models as “Requirements, Design, Implementation, Test, Deployment, and Maintenance” (2009, p. 95). (I have used terminology that is slightly different from Hamilton’s to ensure parallel structure and to use more generic terms that allow for different types of deliverables.)

The basic phases of development models can be characterized as:

- Discovery: Obtaining the information necessary to begin, plan, implement, and refine the deliverable.
- Planning: Determining the best form or structure for the final product, defining goals and criteria for success, and deciding on processes for implementation.
- Implementation (or Development): Creating the deliverable.
- Review: Evaluating the deliverable and measuring the deliverable against the criteria for success.
- Refinement: Implementing the results of review to more successfully achieve defined goals and meet the criteria outlined during the Planning phase.

- Release or Deployment (sometimes called *Implementation*): Delivering or installing, in some form, the deliverable.

Often, an additional phase, related to the maintenance of a product or service, is also part of a development model. For example, in software development, a model may include a maintenance phase to indicate the provision of updates, bug fixes, and more. For the proposed refined iterative development model, I have categorized maintenance as an on-going business process outside of the development process. (See the Assumptions Underlying the Model section for more information.)

Specific models may also contain a single phase or step that reflects more than one of the basic phases listed here. For example, in a model of engineering development (Figure 14; Science Buddies, n.d.), the fourth step (“Brainstorm, evaluate, and choose solution”) contains elements of the basic phases of Discovery, Planning, Implementation, Review, and Refinement. Brainstorming is a form of discovery that produces new ideas and ways of solving problems. Evaluation is clearly related to review, and the implication is that, after evaluation, the results will be refined. Choosing a solution is indicative of both planning and implementation—the results of the brainstorming and evaluation are used in formulating the plan for moving forward.

Understanding the basic phases common to all development models facilitates the creation of an effective, refined development model. Within the overall framework of the basic phases, specific phases can be defined, and then the steps required for each phase can be defined in accordance with a particular industry, organization, or project.

Common uses

The analysis of development models across industries also demonstrates how they are typically used.

- In general, development models are used for:
- Sharing knowledge.
 - Facilitating success.
 - Enhancing credibility.
 - Demonstrating progress.

For example, a Web-design company may publish a development model on its website (e.g., Wyrostok,

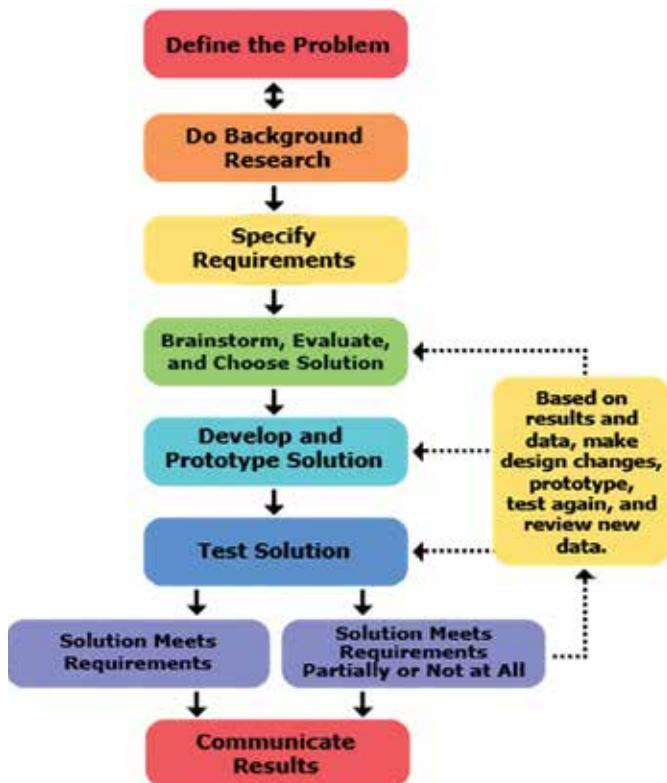


Figure 14. Engineering method. Many models contain a single phase or step that reflects elements of one or more of the basic phases. For example, in a model of engineering development, the fourth step (“Brainstorm, evaluate, and choose solution”) contains elements of the basic phases of Discovery, Planning, Implementation, Review, and Refinement. (Reprinted with permission from Science Buddies, n.d.)

n.d.). The model can be designed as a form of content marketing in which knowledge regarding best practices is shared with potential clients, other businesses, and internal personnel. The model also serves as a form of process documentation, which facilitates the success of the members of the company who follow the model. The model enhances the credibility of the Web design company by demonstrating that their approach is detailed, careful, and planned. In addition, a timeline can be added to the model so that each phase coincides with a unit of time and then used to both estimate project length and demonstrate progress during development. A model “... shows the major steps involved throughout developing a site, and roughly how much effort is involved in each phase and from which side of the Designer/Client partnership the effort originates” (Wyrostok, n.d.).

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Potential benefits There are many potential benefits associated with using development models, and these benefits are outlined in both scholarly and non-scholarly sources. A well-documented and shared development model is a form of knowledge sharing and management, which is an important factor in organizational success: “Knowledge management is especially important in product development and innovation projects that are relatively complex . . . ” (Solli-Sæther, Karlsen, & van Oorschot, 2015).

Proper use of development models can facilitate:

- Greater employee engagement through unity, a shared vision, clear expectations, and increased success (Stoehr, 2012; Weinzweig, 2010). Employees who clearly understand what is expected of them are more engaged, and clear expectations require “a detailed understanding of how what one person is supposed to do fits in with what everyone else is supposed to do and how those expectations change when circumstances change” (Wagner & Harter, 2006, p. 4). Development models can help clarify expectations.
- Business continuity in the form of transitions that are seamless and, therefore, cost-efficient, because “a good process model provides the foundation for documenting procedures” (Berg, 2011, para. 6). Development models can help ensure that new team members and leaders have a clearer vision of the overall process and where in the process the project is at any given time.
- Increased efficiency as a result of revealing points of congestion in the development process (that is, points at which development is slowed or stalled) and sources of duplicate work (Berg, 2011).
- Increased quality as a result of revealing the sources of defects and by enhancing consistency (Berg, 2011).

Development models can also be used as a communication and management tool to demonstrate:

- Quality: Because iterative development models are based, in part, on the premise that a deliverable will need improvement after initial development, the model can be used to demonstrate that, despite the need for additional improvement, quality expectations are being met for a given stage in the process.
- Efficiency: Development models can be used to show where a project is in the development lifecycle, and demonstrate that tasks are being completed efficiently and in accordance with expectations.

- Trajectory: Development models can communicate to others what will happen next. “A process model answers two main questions: What should be done next? For how long should it continue?” (Boehm & Hansen, 2000, p. 4). (The question “How long should it continue?” depends on the parameters within which you are working. You can use a model directly to depict timeframes [e.g., Wyrostok, n.d.], and you can use a model in conjunction with supplementary project management tools, such as Gantt charts.)
- Accountability: A development model can also be used as an aid in project assignments, as each phase and the tasks within it can be assigned to specific people and/or teams.

The Refined Iterative Development Model

The refined iterative development model presented here (Figure 15) is designed to incorporate the characteristics and phases common to other development models and to be useful in meeting strategic business goals, such as increased productivity and overall profit. The model is intended to improve the information development process by allowing for rapid and incremental delivery and for increased quality and efficiency through careful planning and preparation. My intent is to present a methodology that is general enough that it can be adapted to specific fields, organizations, and projects, yet specific enough to account for each necessary phase.

What's new?

The refined iterative development model contains four components not typically found in other development models.

The four components are:

- Three distinct types of iteration (Figure 16), which are:
 - Progressive Elaboration: A type of iteration in which continuous improvement occurs as new and more detailed information becomes available. This form of iteration extends across all of the initial phases of development.
 - Feedback: A type of iteration in which collaboration leads to incremental improvement. This form of iteration can occur at any time in the development process and is concentrated in the periods when one phase transitions into the next.

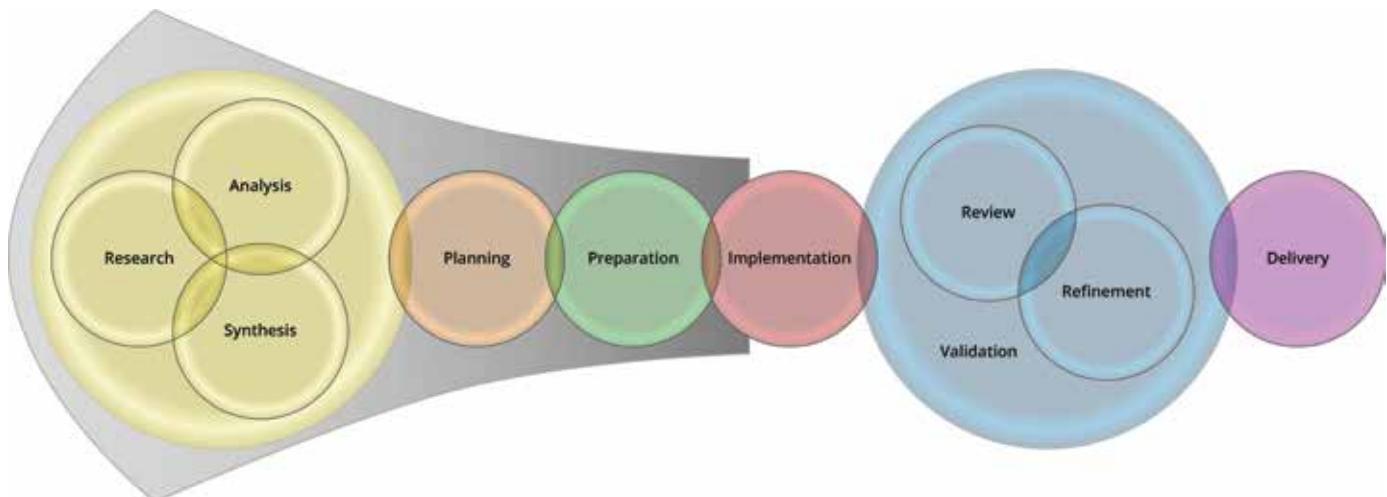


Figure 15. Refined iterative development model. The refined iterative development model contains three specific types of iteration (Progressive Elaboration, Feedback, and Validation) and three new phases (Synthesis, Preparation, and Delivery).

- Validation: A type of iteration in which the deliverable is systematically compared with a pre-determined set of guidelines and standards and then changed as needed to align with the guidelines and standards. Validation is represented in the model as two distinct and interdependent phases (Review and Refinement) near the end of the development process.
- A Synthesis phase: Designed to facilitate innovation and improvement.
- A Preparation phase: Designed to streamline the Implementation, Review, and Refinement phases

by creating standards, templates, repositories, and other tools that reduce duplicate work and increase consistency.

- A Delivery phase: Designed to formalize processes related to ending the project, such as implementing final refinements, obtaining formal acceptance, and documenting lessons learned. (*Lessons learned* refers to important information discovered during the development process that can be retained as part of a knowledge-management system to improve future projects [Project Management Institute, 2008]).

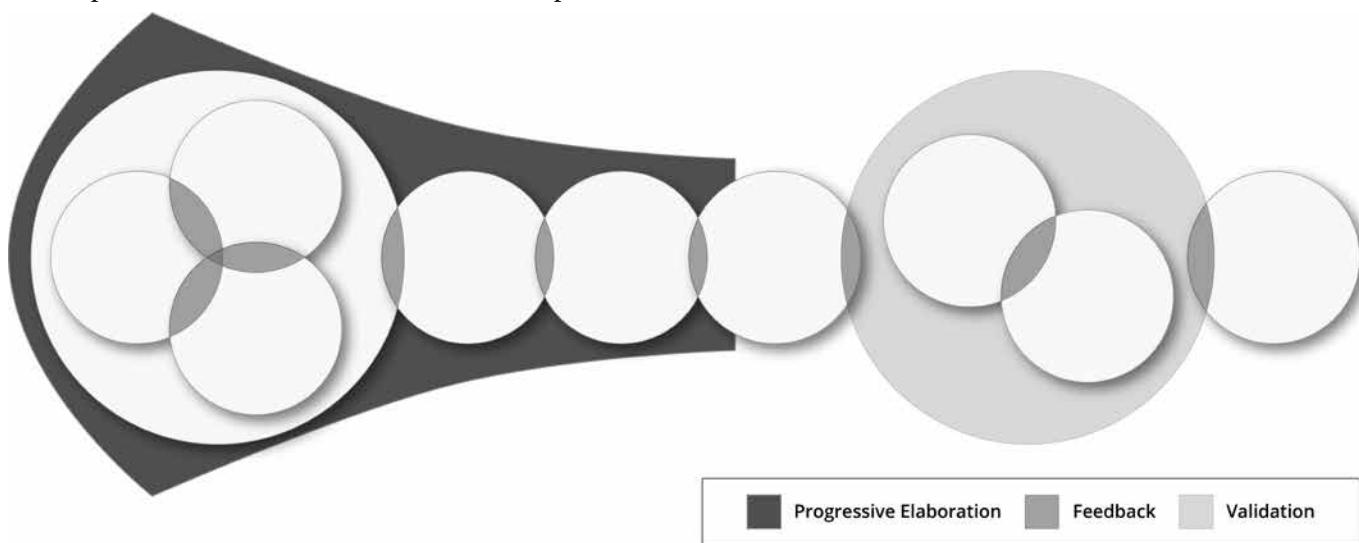


Figure 16. Three distinct types of iteration. The three distinct types of iteration in the refined iterative development model are Progressive Elaboration, Feedback, and Validation. Progressive Elaboration occurs across multiple phases at the beginning of a project, Feedback occurs multiple times throughout the project, and Validation occurs near the end of a project.

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Iteration

Iteration is a fundamental component of the development process (as demonstrated by the earlier discussion of the oppositional relationships between Waterfall and Agile and between ADDIE and SAM).

Iterative processes are often difficult to explicitly define and control. The best methods for dealing with iterative processes depend on many factors, including the availability of subject-matter experts; the availability of data related to the customer experience; the level of expertise and experience of those providing input—both in the subject matter and in reviewing techniques; the technology and systems used to gather information and implement, monitor, and measure improvements; and more.

The processes associated with iteration tend to be inherently and intentionally critical (that is, focused on assessing merits and finding defects), and cultivating a high level of courtesy and professionalism is imperative. As most technical communicators know well, there are many important *soft* skills associated with obtaining useful and relevant input. Respect, politeness, active listening, humility, and a sense of humor are invaluable and are difficult to prescribe using a development model. As with all phases of the development process, managing iterative input must be approached with clearly defined goals and a willingness to adapt to circumstances in order to meet those goals.

Progressive elaboration One of the most important concepts to understand when implementing the refined iterative development model is the form of iteration called *progressive elaboration*. In the field of project management, progressive elaboration is a method for dealing with the fact that, at the beginning of a project, it is impossible to know every detail of the requirements, schedule, budget, and the many other factors that are important to success. Progressive elaboration involves refining, improving, and adding detail as more information becomes available (Project Management Institute, 2008).

Progressive elaboration is a form of iteration that is so intrinsic to the model that it cannot be shown as a discrete phase; it is an on-going process that occurs continuously throughout the early phases of development (Figure 16). Ideally, by the time implementation occurs, this form of iteration is complete, though this is not always the case; with any inventive process that includes many stakeholders, new information can be discovered at any time.

In progressive elaboration, the goal is to have the highest level of detail early in the Implementation phase so that goals and standards are clearly defined and documented and can be used during the Implementation, Review, and Refinement phases.

Feedback Feedback refers to collaborative refinement that takes place throughout the project, particularly as it transitions from one phase to another (Figure 16). For example, as the Research phase comes to a close, feedback is useful in defining what information should be included in the Analysis and Synthesis phases. Feedback provides an opportunity to present the results of incremental progress and to get input before moving forward. Feedback can be facilitated in many ways, such as through meetings, informal conversations, online forums, usability testing, and the exchange of documents with tracked comments.

Feedback is an important element of progressive elaboration in that feedback yields a high concentration of new information that can be used for improvement.

Validation Validation includes the phases of Review and Refinement, which are the most formal and systematic iterative processes and are depicted in the refined iterative development model as discrete, yet interrelated, phases (Figures 15 and 16). Review involves systematically measuring the deliverable against the guidelines and standards outlined during the Preparation phase, and Refinement involves implementing any changes required to align the deliverable with the guidelines and standards.

Reviews are conducted in accordance with standard operating procedures, and review documents are retained and used to implement future process improvements. Standard operating procedures explain what to review; how to word review comments so they are courteous and effective; how to exchange review comments; how to verify that corrections have been made; and, of course, which guidelines, standards, and tools are used to identify a defect.

Note that, from a quality-management perspective, it is also important to validate the validation process; that is, it is important to measure the effectiveness of the Review and Refinement phases by measuring whether the two phases result in the alignment of the final deliverable with the standards and guidelines created during the Preparation phase. It is not sufficient to assume that, by having the Review and Refinement phases in place, they are necessarily effective.

Phases

The following section describes each of the phases in the refined iterative development model and includes possible activities, questions, and potential interim deliverables. These are intended to provide specific examples of what each phase might include and should be modified for each specific development project.

The description of each phase includes:

- Activities: Specific tasks that can be performed during each phase
- Questions: Specific areas of focus that can elicit useful information for improvement
- Potential interim deliverables: Documents, templates, repositories, and other products related to the development process that can be used to communicate the project's progress and value to both internal and external stakeholders. Interim deliverables can be delivered informally through a verbal conversation, or formally through a presentation, a body of information, lists, schedules, reports, and more

Research Research involves gathering together all available information related to the project. Official sources can include existing documentation, interviews with subject-matter experts and customers, and functional tests (user and usability tests) of previous versions and/or similar products. Often, important information can also be gathered from customer support and marketing departments within the company.

There are unofficial sources of information that can be used as well. For example, to gather customer input, you may be able to consult third-party online forums related to the product or service. These can be valuable sources because customers may discuss the difficulties they encounter while using the product or service, and are often more candid than when approached directly. You may also be able to gather the notes and improvised training aids that people—both inside and outside the organization—have created for their own use.

Activities may include:

- Gathering all existing documentation, including notes and job aids created for individual use
- Interviewing subject-matter experts and customers
- Obtaining information from customer service and marketing departments
- Using the product or service

- Conducting user and usability tests of previous versions and similar deliverables
- Researching similar deliverables produced by competitors
- Visiting relevant third-party forums and discussion groups

Questions may include:

- Is the information relevant?
- Is the information accurate?
- Is more information needed for a particular topic?
- Does this information support the customer in completing tasks and making decisions?

Potential interim deliverables may include:

- Research report summarizing progress to date, areas that require further research, general research goals, and gaps in information
- Repositories of content and other assets, such as photos and graphics
- Lists of resources, including documents, subject-matter experts, other departments, and third-party resources
- Lists of potential information categories (topics)
- Graphic representations, such as diagrams, depicting categories and quantities of information

Analysis Analysis is the process of classifying, sorting, and verifying the information gathered during the Research phase. For example, when analyzing information related to an instructional design project, the analysis can help organize information into courses, lessons, topics, and learning objectives. Analysis can also help in sorting conceptual information from task-related information. Sorting the information also facilitates consolidating redundant information and discarding irrelevant information.

Activities may include:

- Reviewing the information in detail
- Classifying and sorting the information
- Verifying the accuracy of the information (testing existing documentation against the product or service)
- Consolidating redundant information
- Discarding irrelevant information

Questions may include:

- Can the information be sorted into groups that relate directly to the completion of specific tasks?

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- Do the categories of information make sense to subject-matter experts?
- Is the information task-based or conceptual?
- Which categories of information are most important in terms of facilitating customer success? Which categories are least important?
- What content can be reused?
- What content can be discarded?

Potential interim deliverables may include:

- Refined list of information categories (topics)
- Graphic representations, such as diagrams, depicting categories and quantities of information
- Flow charts showing user workflows
- Refined lists of prioritized resources identifying those that return the most information and the most accurate information
- Report summarizing progress to date, areas that require further research, specific research goals, and gaps in information

Synthesis While analysis is typified by separating something into smaller, more manageable components, synthesis, in contrast, refers to combining elements together to form something new. The spirit of synthesis is akin to what is often called *design thinking*, a solution-based, creative approach that emphasizes empathy and user-centeredness, reframing all possibilities, and prototyping (Hasso Plattner Institute of Design at Stanford, n.d.). Design thinking is not objective-oriented, “it is people-oriented” (English, 2006, p. 5). The advantage to adding this step to the process is that it provides an opportunity to innovate and to move away from patterns that have been repeated simply to avoid disrupting the status quo. It also supports one of the underlying assumptions behind the refined iterative development model—that the fundamental measure of success is whether information facilitates a positive customer experience.

User-centered design models, which are strongly rooted in human-computer interaction, software development, and other fields (Ritter, Baxter, & Churchill, 2014), often reflect the principles of design thinking and can provide a valuable framework for projects focused on the user experience. (Several different versions of user-centered design models can be found through an Internet search.)

Activities may include:

- Considering every possible approach for the final deliverables
- Considering new technologies and media for creation and delivery
- Researching the techniques used in other fields and for other subjects
- Researching the methods used by competitors
- Questioning whether the requirements are legitimate and necessary and whether the requirements can be met in new ways

Questions may include:

- Is there a better way?
- What assumptions have been made? Are the assumptions valid?
- Are the requirements legitimate and necessary?
- Is the planned deliverable easy to access and use?
- Do users have a high level of control over what information they can access and when?
- Can using a different technology improve the final deliverable or the development process?

Potential interim deliverables may include:

- Summary report of options considered and the advantages and disadvantages of each option
- General plan for implementing the recommended approach
- Example of or detailed description of the final deliverable

Planning Planning refers to the process of establishing goals, defining general criteria for measuring success, formulating a structure for the final deliverable, and creating a plan for the subsequent phases (Implementation, Review, Refinement, and Delivery).

Establishing goals and defining general criteria for success is an important component of the planning phase that makes it easier to make decisions during subsequent phases; the consequences of each decision can be assessed against established goals and criteria.

The structure of the final deliverable can be used to create a work breakdown structure that supports meeting deadlines. Creating a work breakdown structure is the process of dividing “project deliverables and project work into smaller, more manageable components” (Project Management Institute, 2008, p. 116). In developing a manual, for example, a table of contents can be used

as the deliverable structure, and topics within the table of contents can be designated as components of the work breakdown structure. Depending on the specifics of the information development process, there may be additional ways to translate the deliverable structure into a work breakdown structure.

Having both the structure of the information deliverable and the work breakdown structure allows for more successful iteration based on discrete portions of work and also makes it easier to collaboratively decide if specific elements need to be delayed or abandoned in order to meet deadlines. As deadlines permit, topics can be included or excluded, taken through the subsequent phases, and delivered incrementally. This approach can also make it easier to ensure quality, because a condition of inclusion is that quality-related activities are part of the development process and a precondition of delivery.

Activities may include:

- Defining and documenting the overall goals of the project
- Defining and documenting general criteria for determining if the goals have been met
- Formulating the structure of the information deliverable
- Creating a work breakdown structure based on the information structure

Questions may include:

- What are the goals of the project? What criteria can be used to demonstrate that the goals have been met?
- What information structure parallels the customer experience? (In other words, can the information be presented in the order in which the customer is likely to need it?)
- How can the task of completing the final deliverable be divided into discrete, manageable subtasks (a work breakdown structure)?
- Which topics are essential, and which topics are optional?
- Which topics are needed sooner, and which can be delivered later?

Potential interim deliverables may include:

- Outline of topics (such as a table of contents or other type of content-based structure)
- Work breakdown structure
- Project schedule

- Prioritized list of topics and/or tasks that will be included in the final deliverable
- Contingency plan (demonstrating how deadlines can be met by making alterations to the project based on approved priorities)

Preparation While planning is a very common phase in development models, the term *planning* is a very general term and does not explicitly allow for the many tools that can be created to speed up and improve the subsequent Implementation, Review, and Refinement phases. The Preparation phase allows for a specific type of planning that involves creating tools, such as style guidelines, templates, terminology lists, and more. The Preparation phase is critical in terms of quality—without clearly documented standards and correct examples, there is no way to objectively evaluate whether the information deliverable conforms to quality requirements. Consistency, a core component of quality, is also easier to maintain with a careful Preparation phase because guidelines, templates, etc. can be developed as a cohesive group.

The time invested in the Preparation phase also saves time during the Implementation, Review, and Refinement phases. By adding Preparation as a discrete phase, proper resources can be dedicated to ensuring that information development tools are in place, functional, reviewed, and approved. Doing so reduces the need for time-consuming discussions and decision-making about non-variable elements of design during implementation. For example, in software development, preparing a repository of carefully worded error messages can reduce the amount of time that developers, quality assurance specialists, and other stakeholders spend on writing, reviewing, and editing the messages.

There are massive bodies of work that already exist regarding guidelines and best practices for information-related design projects, and these should be used as a starting point. For example, the Microsoft Developer Network outlines best practices in software development and is available to the general public (<https://msdn.microsoft.com/en-us/default.aspx>). In terms of style guidelines, there are many comprehensive style manuals to choose from, such as the *Chicago Manual of Style* or *Scientific Style and Format: The CSE Manual for Authors, Editors, and Publishers*. When choosing such tools, it is important to consider the origins, audience, and intent of the tools to ensure they are suitable. After

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determining which of these types of existing tools to use, then additional standards and exceptions specific to your industry, organization, or project can be documented.

The Preparation phase also has important consequences in terms of managing human resources (that is, talent retention); studies have shown a clear correlation between the level of achieved quality in the workplace and employee morale: “There is a very direct link between an organization’s decision to implement excellence and its’ [sic] impact on employees” (Stoehr, 2012, para. 5). Including a Preparation phase is likely to increase employee morale and have additional related benefits that support strategic business goals.

Activities may include:

- Investigating and adopting existing tools created by other organizations and adapting the tools as needed
- Clearly defining quality by creating standards and tools (such as style guidelines, terminology lists, templates, and asset repositories, such as user-interface kits, images, etc.)
- Creating additional job aids (such as standard operating procedures, quick-reference guides, style sheets, etc.)

Questions may include:

- Which elements of the final deliverable are non-variable?
- Do the standards reflect industry best practices?
- Do the templates provide for a wide enough variety of circumstances?
- Are the standards and tools easy to access, understand, and use?
- Is training required?

Potential interim deliverables may include:

- List of approved resources developed by third parties
- Customized style guidelines, templates, terminology lists, quick-reference guides, and other tools
- Clear guidelines regarding quality and quality assurance processes (for the Review and Refinement phases)
- Instructional documentation and training for using the tools
- Record of approval of the guidelines and tools

Implementation Implementation involves the actual creation of the deliverables. Because standards, templates, and other tools have been created during

the Preparation phase, the Implementation phase has the potential to proceed more quickly and efficiently than if these tools were simultaneously created during implementation. Developers have the freedom to focus on their areas of expertise, rather than on mundane, non-variable details.

Activities may include:

- Creating the deliverable
- Refining the standards and tools created during the Preparation phase

Questions may include:

- Can any of the information gathered through progressive elaboration in the previous phases be used to streamline the Implementation phase?
- Are the standards and tools created during the Preparation phase facilitating successful implementation?

Potential interim deliverables may include:

- The final deliverable or components of the final deliverable
- Refined guidelines, templates, and other tools

Review The Review phase includes the processes related to testing, validation, and quality assurance. For this phase to yield the highest returns in terms of improvement and meeting requirements, it is imperative that standards and other tools from the Preparation phase are in place. Such tools allow reviewers to assess quality more objectively and to quickly point to the solutions documented during the Preparation phase. In software development, for example, having a standard set of phrases and terms that should be used in the software means that the review process consists of comparing the final deliverable with the standard set and identifying discrepancies.

Activities may include:

- Verifying that the standards outlined during the Preparation phase have been applied
- Verifying that graphic and other elements from the repositories have been used properly
- Editing
- Testing functionality and user and usability testing

Questions may include:

- Can any improvements be made to the review process or to the tools created during the Preparation phase?

- Are the changes being requested consistent with the standards and tools created during the Preparation phase?
- Is training required for reviewers?

Potential interim deliverables may include:

- Review comments, responses, and approvals
- Recommendations for improving the tools generated during the Preparation phase
- Refined guidelines, templates, job aids, etc.
- Refined documents related to the Review and Refinement phases
- Metrics related to how closely the deliverables match the guidelines

Refinement Like the Review phase, the Refinement phase is highly dependent on the previously created standards and tools. Using the standards and tools has the potential to make correcting defects a process that proceeds quickly, as the standards and tools provide guidance for making corrections. The main activity during this phase is to use the standards and tools to ensure the alignment of the final deliverable with the guidelines and other tools created during the Preparation phase. From a project-management perspective, the questions to ask at this time are not whether the information deliverable needs to be revised (the Review phase should provide that information) but whether the standards, tools, and review processes themselves are providing an adequate basis for refinement.

Activities may include:

- Correcting defects in the final deliverable in accordance with the standards and tools
- Making recommendations for improving the tools generated during the Preparation phase
- Making recommendations for improving the processes related to the Review and Refinement phases

Questions may include:

- Do the standards and tools need to be modified in any way? Are they providing an adequate basis for refinement?
- Are the review processes effective in facilitating refinement?

Potential interim deliverables may include:

- The final deliverable or components of the final deliverable

- Review approvals
- Metrics regarding quality
- Recommendations for improving the tools generated during the Preparation phase

Delivery A Delivery phase is included in the refined iterative development model for two reasons. First, it clearly indicates the end of the project. Some development models do not include a Delivery phase, and some visually depict an endless cycle of development, which makes it more difficult to see when the project is complete. Having a discrete end phase helps ensure that the goal of delivery is specific and defined. Second, the Delivery phase provides an opportunity to define the detailed steps specific to ending the project and delivering the final deliverable.

In project management, the Closing phase is an important part of the project management process, and includes processes related to lessons learned, official acceptance documentation, reallocating resources, reusing assets, and getting paid (Project Management Institute, 2008). A discrete and clearly defined Delivery phase allows for such closing processes.

There are also opportunities for iterative improvement during the Delivery phase. However, if the previous phases are implemented successfully, the amount of iterative improvement during the Delivery phase should be minimal.

Activities may include:

- Delivering the finished deliverable, or components of the finished deliverable
- Performing closing activities related to general project management (See Project Management Institute, 2008, for more information)
- Gathering information that might help improve the deliverable and the development process

Questions may include:

- Are there any remaining improvements required for the deliverable?
- What can be done to improve delivery of the next project or component?

Potential interim deliverables may include:

- The final deliverable or components of the final deliverable
- Acceptance documents, lessons learned, and other documents related to closing processes

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- Recommendations for improvement during the previous phases of the project
- Report on the effectiveness of the Review and Refinement phases

Concepts important to successful implementation

As demonstrated by the earlier analysis of the false oppositions between Waterfall and Agile and between ADDIE and SAM, having a deep understanding of the intent of a development model is important to successful implementation. This section is designed to explore concepts that can aid in successfully implementing the model.

These concepts include:

- Obtaining an expert-level understanding
- Clarifying the guiding vision: Understand where you are, where you're going, and why
- Getting started
- Documenting and communicating the model and associated processes
- Narrowing the gap between the processes outlined by the model and processes actually being used
- Understanding the assumptions that underlie the refined iterative development model

Expert-level understanding To use a development model successfully, it is important to have a deep understanding of the overall intent of the model, as well as the detailed steps. As demonstrated earlier in this article, by its very nature, development is iterative and dynamic, and, in a business environment, many factors can influence the direction and requirements of a project. Having an expert-level understanding makes it possible to adapt to changing requirements while consistently working to achieve larger goals: “Experts use models . . . by first looking at them to understand the intent of the model and see the recommended processes, then by making adjustments when applying the model to their specific circumstances . . .” (Hannum, 2005, p. 10).

Interestingly, both Benington (often cited as a source for the Waterfall model) and Hannum (an author of the ISD model, which evolved into ADDIE) published retrospectives many years after their original work, and both note the misapplication of their approaches (Benington, 1983 and Hannum, 2005, respectively). Hannum notes that, “. . . criticisms of ISD seem to arise from a lack of understanding of the ISD model, especially the underlying theory and principles, as well as the intent

of the model” (Hannum, 2005, p. 10). Hannum warns against a novice-level approach and writes that applying the model in an effective manner requires an expert-level approach: “. . . developers who are relative novices . . . may cling to the model and treat it as a paint-by-numbers approach. Novices in any field have a tendency to latch onto any guidance and follow that guidance in a literal, step-by-step manner. Only later, when they become more proficient, do novices adapt [sic] a more flexible approach” (Hannum, 2005, p. 10).

As described by Karl Weick, professor of psychology and organizational behavior, “. . . if you want to preserve your ability to adapt to change,” then the “the act of understanding progresses through three stages: superficial simplicity, confused complexity, and profound simplicity” (Weick, 2007, p. 10). Only with a deep understanding of the intent of the model, as well as the detailed steps, can the model be applied with a profound simplicity.

While the false oppositions described earlier can be understood as rhetorical tools for promoting one model over another and interpreted as a positive indication of a desire for improvement, the misrepresentation of the older models indicates a lack of understanding and leads to the expenditure of time, effort, and other resources on unfounded criticisms—resources that could be better spent on creating an adapted approach that facilitates successful projects.

The misinterpretation and misapplication of development models can also lead to a great deal of unnecessary expense as companies invest in large-scale, systemic changes that aren't necessarily warranted—a subtler and more expert-level approach, in which a model is adapted based on concrete circumstances, is likely to be less expensive and more effective.

Vision Defining the overall vision and larger goals associated with using a development model is also critical to successful implementation. A vision is “a picture of what success looks like . . . at a particular point in the future” (Weinzweig, 2010, p. 98). Defining success ensures that everyone is working toward the same goals. Most importantly, having a clear and shared vision helps inform and guide the decisions that are required on a daily basis to deal with difficult and changing situations.

A well-crafted vision includes an assessment of the current situation, a clear picture of the future situation, and a clear explanation of why the transition is beneficial. Ideally, before beginning to implement a

new development model, it is best to have a thorough understanding of existing processes. This allows you to identify specific improvements and establish a baseline for measuring those improvements. However, this is not always feasible or worthwhile; when no processes are in place, or if processes are too chaotic, it may be wiser to invest available time and other resources in moving forward. Whether to document existing processes depends on the resources available, the level of organizational support, the overall goals in terms of process improvement and metrics, and other factors.

Getting started Often, the best way to begin to implement a development model within an organization is to start teaching it, either informally (to interested colleagues) or formally (to organized groups). As stated by Ari Weinzweig in the essay “Creating Recipes for Organizational Success,” “ . . . in the theoretical organizational world you have to . . . define it before you can teach it. But I’ve also learned from 25 years of doing this stuff that if we don’t commit to teaching our recipe we’ll probably never make the time to define it” (Weinzweig, 2010, p. 73). Committing to teaching the model imposes a deadline, ensures accountability, and begins the process of collaborative adaptation. Making a commitment to teaching the model provides impetus for documentation, communication, adaptation, and refinement.

Documentation and communication

Documenting and communicating the model, the detailed steps in the processes, and the overall vision are essential to successful implementation. “You really need to write your vision down to make it work . . . Yes, if you want your vision to be effective, you have to not only document it, but actually tell people about it” (Weinzweig, 2010, p. 98).

Documenting and communicating help to clarify the steps, facilitate adaptation and refinement, and ensure accountability—it’s more difficult to deviate from a process when everyone has the same expectations of what the process entails.

Closing the gaps A critical element in successful implementation is to close the gaps between the processes depicted in the model and the processes that are actually used in practice. Espousing a model that is not followed can be more damaging than not using a model at all because it creates dissonance, mistrust, and a sense of futility. It also undermines the authority and credibility of those responsible for promoting the model

and leading its use: “I would suggest very strongly that the more we tolerate gaps . . . the lower our credibility as leaders . . . ” (Weinzweig, 2010, p. 82).

To close the gaps, it is important to identify what gaps exist and why. Then training, support, and tools can be provided to make it easier to follow the model. If necessary, the model can be revised to reflect the existing processes.

Assumptions underlying the model The refined iterative development model is based on several assumptions regarding the purpose of the model, who is responsible for ensuring quality, the user (customer) experience as the ultimate measure of quality, the scope of the development process, and the supportive nature of most information development. Understanding these assumptions is key to implementing the model with an expert-level understanding.

Purpose The purpose of the model is to serve as a tool to enable success and to increase quality—the quality of both the final deliverable and the development process. At the most general level, the quality of the product depends on how useful and accessible (easy to use) it is for the customer. The quality of the process refers to how efficient it is and to what degree it enables the success of the people involved in development.

The model should be implemented as a methodology, rather than an ideology; that is, it should be implemented with a healthy degree of skepticism based on its practical value, rather than adopted as an end in itself. While the model is representational, rather than literal, its value is grounded in its practical application, rather than in theoretical and political ideals. The model should be modified and adapted to facilitate the highest levels of quality and success.

Quality responsibility In many development environments, products are delivered at a low level of quality with the implied expectation that quality issues will be addressed after delivery as a result of customer evaluation. The refined iterative development model is built on the assumption that the organization, rather than the customer, is responsible for defining and ensuring quality.

Customer experience The refined iterative development model is built on the premise that the ultimate measure of quality is whether profitability and value have been maintained while ensuring a positive customer experience. At the most fundamental level, the highest quality information design is invisible; that is, the customer is able to access the information he or she

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needs to perform a task or to make a decision, without the design of the information interfering.

Scope of the development process The refined iterative development model focuses solely on the processes directly related to development. Because all information deliverables require maintenance and updating (due, in part, to the fluid and dynamic nature of language itself), the refined iterative development model does not include an explicit phase for maintenance and updating. The model is focused instead on the development (or inventive) process. The actions that ensure the deliverable is kept up-to-date are classified as business (on-going, or operational) processes and, therefore, are outside of the model.

The supportive nature of information development In some cases (such as with many instructional design projects), an information deliverable is the final product intended for a client. However, information development often occurs in support of a separate, primary service or product. An example of this might be help documentation in support of a software application. As such, it is critical that the information development process coincide with and support the development processes that underlie the primary product and/or service (Hamilton, 2009).

Within some companies, information development is viewed as a necessary cost, rather than as an important component of a revenue-generating product or service. As described by Hamilton (2009), in his book *Managing Technical Writers: A Real World Guide to Managing Technical Documentation* (which is focused on working in an engineering environment), “ . . . technical documentation is viewed with disdain by many engineers and lives at the bottom of the power hierarchy in most companies. A significant amount of your time as a documentation manager will be spent working to gain respect, power, and leverage so you can do your job” (Hamilton, 2009, Preface).

Hamilton refers specifically to how this affects scheduling: “ . . . documentation managers usually find themselves fitting their work into an existing schedule, rather than creating a schedule that fits their work” (Hamilton, 2009, p. 14). The concept of fitting the information development process into the framework of the primary development process extends beyond just the schedule and includes everything from larger business goals to available resources: “In the real world, you will probably have little input into the development methodology

chosen by your project managers; you will need to fit into an existing structure” (Hamilton, 2009, p. 99).

The refined iterative development model is designed to be both flexible enough to support working within an overarching development process and to function as a primary framework.

Conclusion

The analysis and comparison of models across industries reveals that development models, like all models, are visual, relational, and representational. Development models are process-oriented, depicting a series of actions or steps taken to achieve a specific outcome. Development models are inventive, resulting in the creation of something new. Development models are also both sequential (outlining steps that performed in a specific order) and iterative (outlining steps that are repeated to ensure improvement). The basic phases of Discovery, Planning, Implementation, Review, and Refinement are common to most development models. Development models are used to demonstrate credibility, increase quality, streamline communications, facilitate business continuity, and more. As tools for process improvement, they can have tremendous value.

Applying these principles and concepts, it is possible to create a model (the refined iterative development model) specifically adapted to facilitate rapid and incremental delivery and increased quality and efficiency. The refined iterative development model specifies three different types of iterative processes (Progressive Elaboration, Feedback, and Validation) and includes three phases typically not found in other development models (Synthesis, Preparation, and Delivery).

Successfully implementing an iterative development model requires an expert-level approach that ensures a deep understanding of the intent of the model, an overall vision of success, getting started to create impetus, documenting and communicating the model, and closing the gaps between the processes outlined by the model and actual processes in use. It also requires a basic understanding of the assumptions that underlie the model.

Future directions

It would be interesting and useful to conduct case studies by implementing the refined iterative development model and measuring its effectiveness in different development environments. While I have successfully followed the

model for developing technical training documentation (personal observation, 2013–2015), conducting formal case studies would likely yield results that could be used to further refine and improve the model.

The components of the refined iterative development model are based on study, training, and personal experience in different fields. The Synthesis phase, for example, is based on principles from the fields of fine art and design—particularly an area of study called *design thinking*. The Preparation phase is based on principles from fields that require hands-on creation, such as construction and furniture-making, in which a lack of preparation can result in the tangible loss of material, as well as in the loss of less tangible resources. The Preparation phase is also based on experience in the fields of instructional design and software development, where thoughtful preparation can lead to greater consistency and efficiency. The Delivery phase is largely based on best practices from the field of project management and the processes related to project closure. The specificity of the three forms of iteration reflect best practices in scientific communication, in which precise definitions are vitally important. Because the model is based on an interdisciplinary approach to development, I would like to see ongoing discourse about the model from those working in different fields and with different areas of expertise in order to find the model's strengths and weaknesses and further refine and improve the model.

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Manuscript received 24 July 2015, revised 19 January 2016; accepted 1 March 2016.

Using Process Modeling Notation to Map the Buying and Selling of Complex Software Solutions: A Qualitative Study's Implications for Practice and Pedagogy

By Brian Ballentine, West Virginia University

Abstract

Purpose: To demonstrate the importance of standardized process modeling notation and its value to technical communicators involved with visualizing business or technical processes. To argue that a standardized process modeling notation can assist with bridging cultural communication gaps brought on by globalized workplaces.

Method: A rhetorical analysis emphasizing how effectively technical communication visualizations address audience, purpose, and documentation conventions. Communication visualizations were modeled first using nonstandard and then standardized modeling techniques. The visualizations were generated as part of a qualitative study to represent the business and communication processes of a senior level employee from a software firm.

Results: Nonstandard or proprietary data models and visualizations are not readily useful to diverse audiences, especially global audiences. Models should be developed with notation software that supports open standards.

Conclusion: Technical communicators should become proficient with process modeling notation and understand the fundamentals of standardized notations such as Uniform Modeling Language (UML) and Business Process Modeling Notation (BPMN). Academics teaching and researching technical communication should be wary of creating a divide between industry and the academy by perpetuating the use of non-standard models.

Keywords: UML, BPMN, process modeling, data visualization, business analyst

Practitioner's Takeaway:

- Numerous free and open source process modeling applications are available for download and use on Linux, Mac, and Windows operating systems. Numerous free references are available online for learning process modeling notation.
- Process modeling notation is not a skill or a task reserved exclusively for business analysts. As the field of technical communication expands and shifts, practitioners should understand the fundamentals of process modeling.
- Because small companies also cultivate global customers, communicating and collaborating via standardized process models can help bridge cross-cultural communication gaps.

Introduction

As the ideologies of Business Process Management (BPM) continue to push the public and private sectors toward optimizing their practices, knowledge workers of all kinds, including technical communicators, face both challenges and opportunities (Dumas et al., 2013). Key components of increasing business efficiencies are the abilities to identify and then model visually the complexities of an organization's varying practices and relationships. The purpose of this article is to demonstrate the importance of understanding recent advancements in standardized process modeling notation so technical communicators may continue to add value to their organizations and succeed in the globalized workplace. The primary claim is that proficiency with modeling languages such as Business Process Modeling Notation (BPMN) and Uniform Modeling Language (UML), both discussed here, is now a necessary component of a technical communicator's evolving skillset. Additionally, this article functions to highlight potential disjunctions between the complex theories underpinning academic research and instruction (activity theory, actor network theory, genre theory, and combinations thereof) and their utility in the workplace.

The contents of this article were derived from a qualitative case study involving a senior member of a software development firm and her interest in gaining a different perspective on her workflow for new client acquisitions. Details of the case are provided for context but at the crux of this entry is a rhetorical analysis of the visual models originally created for the study results. Rhetorically, these models were found to have failed on the levels of audience, purpose, and conventions, three key aspects of successful technical communication. The results of that analysis alongside the visualizations redesigned using the standardized modeling language BPMN reveal a significant gap between academic approaches to, and instruction for, modeling business processes and the demands the workplace is making on modern technical communicators. In other words, the article offers a specific instance of what Spilka (2009) described as a real problem for the field: "A disconnect exists between the centrality of research to the work of many, if not most, technical communication practitioners and the growing evidence that academic programs in the field are not providing sufficient research training" (p. 219). Contributing to the

disconnect is the fact that the demands of the workplace are shifting. The current president of the Society of Technical Communication, Bernard Aschwanden, noted recently in *Intercom* (2015) that, "the 'writer' role is evolving and changing into a career that is linked to business processes, user analysis, sales and marketing, and helping to generate revenue for a company" (p. 15). The overarching goal of this article, to advocate for proficiency and use of standardized modeling languages, is one way to keep pace with these changes.

Additional context from the study

The larger context for this article is a movement within local governments to turn toward procuring new software solutions for improving both performance and transparency. Specifically, governments are implementing new third-party business information (BI) and performance management (PM) software solutions to not just manage, measure, and report on their services, but to enable higher-quality data analyses that provide broader, more holistic views of their operations (Harder & Jordan, 2012). More prominent offerings in this space include products such as IBM's Cognos suite of applications that promise to change "data into views of your organization's operations and performance so your decision makers can capitalize on opportunities and minimize risks" (IBM, 2016, p. 1).

The original study worked with a much smaller (~40 employees), yet global software firm that develops PM software for local governments. And while the firm's headquarters are in Europe, I worked in cooperation with the company's U.S. Vice President (VP) of Operations for their North American clients, who, in her own words, is a "glorified technical writer" and conducted a 6-month qualitative study involving interviews, participant journaling, and artifact collection. The study's objective was to trace different genres (i.e., specific kinds of documents) across complex communication networks as the VP responded to a Request for Information (RFI) with the intention of continuing the process for the subsequent Request for Proposals (RFP) issued by a city government. The VP, in turn, would receive business process models visualizing her own workflow to gain different perspectives on her own processes.

Ultimately, the data models presented to the VP were less than satisfactory and dubbed "proprietary" to an academic environment. Again, an analysis of these

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models shows they fail in their purpose to provide an audience with a new, useful view on client acquisition largely because of the nonstandard formatting conventions. The VP recommended Unified Modeling Language (UML) and Business Process Modeling and Notation (BPMN) for data visualizations due to their advancements in modeling not just software but also more fluid business interactions. She stressed the importance of using a standardized modeling language that would be immediately recognizable and useful to her and her colleagues. Attention to and the adoption of standards emerged as a key outcome. As will be discussed, standards are held up as a means for technical communication practitioners to navigate communication complexities brought on by globalization. As Getto and St. Amant (2014) note, "Just because individuals from different nations and regions can interact does not necessarily mean they will interact effectively or efficiently" (p. 24). And, the push for efficiency, especially in terms of increasing revenue, is not going to subside for technical communicators.

In order to explore the disconnects noted by Spilka (2009) between academic instruction and practitioner needs, particularly in regard to how disconnections may lead to inefficiency, this article begins with an overview of workplace writing methodologies including genre and activity theory as well as actor-network theory (ANT). The review highlights the challenges facing researchers studying knowledge workers operating in networked and distributed communication environments. The introduction reinforces the importance of qualitative research to technical communication and the article is constructed in such a way that it attempts to reflect on available resources for conducting qualitative studies while also providing brief context from this small, specific study. The article overviews the collecting of the data for the study as well as attempts to model that data, but the result is closer to what Wilson (2001) described as a "confessional case study" as he discussed strategies for a postmodern technical communication pedagogy (p. 79). Qualitative case studies are time intensive, even for a small-scale endeavor such as this. It was not until I attempted to begin modeling visualizations of the study's framework that I received pushback from the VP. The discussion of that pushback and the rhetorical analysis of the models produced are not meant to be an indictment of anyone, any specific text, or a specific method or methodology, but rather a report on attempts

to recalibrate my teaching strategies based on feedback from an experienced practitioner.

As with other small-scale qualitative studies, "[r]ather than aiming to generalize about large populations" the goal was to open a "view on the specific situation or phenomenon being studied" (Koerber & McMichael, 2008, p. 462). That is, the challenges encountered here with this convenience sampling of data would not necessarily be replicated elsewhere. Nevertheless, the article's ultimate objective is to use the study experience, including an analysis of the models produced as part of the study, to advocate for proficiency with standardized modeling languages. As will be discussed, advocating for modeling languages such as UML and BPMN has implications for both teaching and practice. The article offers an overview of the open source UML/BPMN application Modelio as an introduction to the benefits of standards-based modeling and provides a sample diagram.

As is customary with *Technical Communication*, the article continues by offering suggestions for practitioners including how they might interact more "effectively and efficiently" in international contexts based on this study's outcomes (Getto & St. Amant, 2014, p. 24). Current scholarship on process modeling notation suggests that standards-based notations are a useful when addressing cross-cultural communication issues.

Finally, the article contends with Rude's (2009) observation that "[t]he connection between pedagogy and practice is close," or at least it should be (p. 182). And, it offers both questions and some suggested answers for academics and practitioners related to Spilka's (2009) concerns about disconnects between teaching and practice: Do the learning objectives for our research methods courses include data visualizations and modeling techniques recognized by industry professionals? How can we teach methods and methodologies in a fashion that balances practical know-how with the field's theoretical work that remains so crucial to critical and analytical thinking? What can we learn, or borrow, from data visualization standards such as UML and BPMN already in use by business analysts?

Technical Communication and Workplace Writing

Scholars affiliated with professional and technical communication have studied workplace writing within a variety of conditions and settings (Johnson-Eilola,

2005; Henry, 2000; Spinuzzi, 2003, 2008; Van Nostrand, 1994, 1997; Winsor, 1996, 1999, 2001). Van Nostrand's research (1994, 1997), for example, maps the different genres developed and exchanged between the U.S. Department of Defense and potential vendors bidding for federal research and development funding. The defense procurement system constitutes an "activity system" and by tracking the genres within the system, the "close connection between persuasion and knowledge production" is revealed (Van Nostrand, 1997, p. 141). The procurement process works because the rules governing the process as well as the eventual contractual agreements that bind both parties are captured in a variety of documents. In other words, "the documents represent coded and keyed events in a discourse exchange system; they are conspicuously genres" (1994, p. 111). And, as genres, we can conceptualize them as typified rhetorical actions or responses to a typified social context (Miller, 1984). For Van Nostrand, tracking and analyzing genres are the keys to understanding knowledge production. This situation is one of importance to technical communicators because it demonstrates the power and the range of influence their communications can have within these systems.

This is not to suggest, however, that activity systems such as those documented by Van Nostrand are fixed, rigid structures. While genre theory traditionally understands the social context as giving shape to texts, researchers of workplace writing have introduced activity theory to their methodologies to account for agency and the change brought about by the recursive interactions among different actors, tools, and texts (Russell, 1997; Winsor, 1999). With the introduction of activity theory, we can "theorize about the simultaneous existence of regularity and change and about the influence of systems and the role of agency" (Winsor, 1999, p. 201). Such an approach has much to offer technical communicators because it supplies additional evidence that their work is not merely formulaic or rigidly predetermined. The flexibility within genres allows communicators to execute a greater degree of agency.

Genre theory and activity theory were combined into a methodology termed *genre tracing* by Spinuzzi (2003) so he could study traffic workers in Iowa and their use of a database of traffic accidents. This methodology enables researchers to track genres as they morph and intermingle within activity systems

in addition to examining how genres may be used to build or tear down those systems. Following Medvedev and Bakhtin (1978), Spinuzzi casts genres as emerging from "cultural-historical activity" or "tradition" (2003, p. 41). That is, "[g]enres are not discrete artifacts, but traditions of producing, using, and interpreting artifacts" (p. 41)—a factor important to technical communicators because it suggests their work can remain relevant well beyond a single moment in time.

Tracing genres through networked communication environments poses new challenges for researchers of workplace writing, and chief among them is the distributed and fragmented quality of computer-mediated communication. In his introduction to the special issue of *Technical Communication Quarterly* dedicated to distributed work, Spinuzzi (2007) states, "work is becoming more distributed: distributed across time, space, disciplines, fields, and trade; distributed across a multiplicity of stakeholders; distributed through telecommunications and digital technologies" (p. 272). In other words, the VP's conference calls, emails, texts, proposal drafts, handwritten notes, site visits with the potential client, and meetings at corporate headquarters represent the new distributed work and the expanding roles of a technical communicator.

This distribution has effectively destabilized the modularized work endemic to 20th century business practices. Fixed hierarchies have been replaced with fluid networks and "assemblages that may or may not be stable from one incident to the next and in which work may not follow predictable or circumscribed paths" (Spinuzzi, 2007, p. 268). Researchers in technical communication have embraced Latour's (2005) actor-network theory (ANT) as a means for understanding agency within webs of human and nonhuman actors (Potts, 2009, 2010; Rice, 2009; Spinuzzi, 2008; Swarts, 2010; Whittemore, 2012). As Swarts (2010) observes, "distributed work lacks inherent order and does not acquire it unless some force stabilizes (at least temporarily) the objects of work and the relationships between people and texts that rely on those objects" (p. 130). Stabilizing forces can come in the form of some unexpected objects. For example, the influence of nonhuman actors is captured in Whittemore's (2012) case study of "ephemeral texts in design arguments" and his use of Latour's three-part agonistic model of inscribing, mobilizing, and cascading to make sense of his collected data (p. 416). Ultimately, Whittemore

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traced the influence of a reminder note written by a technical communicator as a key factor in the communicator's ability to argue successfully for design changes to a user interface. For technical communicators working in industry, these factors mean that all forms of communication, even the seemingly insignificant, have the potential for profound impact.

Examinations of distributed work usually identify the technical communication labor being performed as knowledge work, or what has been called symbolic-analytic work (Reich, 1991). Symbolic-analytic workers, as described by Johnson-Eilola (2005), face the burden of keeping pace with these changing networked work structures and new required skill sets: "People in this type of work identify, rearrange, circulate, abstract, and broker information" (p. 28). In other words, "symbolic analysts are people we might think of as *technical rhetoricians*" (p. 19, emphasis in original). Technical both because they are skilled at working with and adjusting to the technical materials encountered while collaborating with subject matter experts and other colleagues, but technical also in their proficiency with ubiquitous computer-mediated communication software and networks. Symbolic-analytic workers are rhetoricians in the sense that they, too, are producers of content and must focus on "process, action, and reception" to be successful (Porter, 2013, p. 136).

For technical communicators in industry, these ideas are important because they again reveal that the knowledge work they perform has the potential for long-range influence and improved efficiency—that is, influence beyond immediately perceived audiences and short-term results. The documents the VP prepared during the different phases of the RFI were as much about educating the city, her potential client, about PM software solutions as they were about persuading a wide range of stakeholders. If the city feels confident enough about what was learned in the RFI stage to move forward with an official RFP, the work done at the RFI stage was a crucial step toward winning a contract for the city's business down the road.

Observing divides between teaching & practice

In a brief article in *Technical Communication Quarterly*, Charney (2015) challenges the assumption that research in our field must be driven by or begin with one particular question. The assumption continues that research must then proceed in a linear fashion in

pursuit of an answer. Instead, Charney observes: "In real life, though, the method or the site or some special interest comes first. You realize you have access to a workplace or an archive of records" (p. 105). Her larger point is that research may begin with "an assortment of starting points" (p. 105). Such is the case with this project. A colleague who knew that I had worked in industry as a software developer and technical writer introduced me to the VP. At the time, the VP was interested in recommendations for communication strategies for getting feedback from her existing clients to her company's development team overseas. As Charney suggests, I suddenly realized I had access to a new research site. And, as a curriculum director for undergraduate and master's level professional writing programs, working with the VP afforded the opportunity to explore divides between program curricula and practice.

As noted previously, the field of technical communication has produced a number of exemplary articles and book-length projects using qualitative methods to study workplace research sites. As researchers learn of the benefits of appropriating methods from the social sciences, the field has also begun to address issues arising from the use of qualitative methods (Campbell, 1999, p. 533). For example, Koerber and McMichael (2008) offered their primer for conducting qualitative studies in an effort to speak to what they saw as a gap in the field's available literature. Their primer certainly succeeds as a good addition to graduate courses introducing students to research methods, and, as instructors, we should continue to reflect on how we teach qualitative methods in relation to how we deploy those methods as researchers and practitioners. More recently, the third edition of Miles, Huberman, and Saldaña's *Qualitative Data Analysis: A Methods Sourcebook* (2014) and Saldaña's *The Coding Manual for Qualitative Researchers* (2013) were reviewed as "invaluable to technical communication researchers and practitioners, including students and those working in industry, as the field continues to rely more on qualitative methodologies" (Hashimov, 2015, p. 112).

After semi-structured telephone and in-person interviews with the VP, it was agreed that I would first need to spend time learning about her business and the market for PM software. Key features of qualitative sampling include setting effective boundaries for a study as well as creating a conceptual frame to help

“uncover, confirm, or qualify the basic processes or constructs that undergird [a] study” (Miles, Huberman, & Saldaña, 2014, p. 31). Toward those ends, I scheduled regular interviews (approximately every one to two weeks) with the VP to better grasp her work practices including her use of analog and digital tools, her project management style, and the structure of her organization and her key collaborators. She also provided me with corporate marketing literature as well as outside sources to introduce me to the industry in order for her communications to have more contexts. She fielded my additional questions about her company and the market via phone, email, and text. Because the VP works simultaneously supporting existing clients while also striving to acquire new clients via RFI and RFP submissions, it took several months to determine how we would create boundaries and a beginning framework for the study. Primarily due to timing and schedule availability, we agreed that the study would focus on her networks of communicators and the communication artifacts developed as part of the VP’s work responding to a single RFI issued by a city government located in the Pacific Northwest. The RFI issued by the city contained project deadlines and software application requirements that would help establish project boundaries and frames for the data collected. If the city moved forward by issuing an RFP, we would continue the study with the RFP in the same fashion.

The RFI: Boundaries & frames. With the RFI providing boundaries for the study as well as key requirements for a conceptual frame, we proceeded by determining the artifacts and the information that would be collected during the RFI timeline. The VP agreed to track and save the iterations of her RFI submission by file name and file type as well as provide a brief journal entry about the iterations including content additions and deletions. She used a spreadsheet to manage document versions and each version was tagged as a “parent” or “child” to signal relationships between different documents and their content. In between versions, she had email exchanges and conference calls with her home office. In turn, I created a spreadsheet as a data accounting log to track the different artifacts sent by the VP (Miles, Huberman, & Saldaña, 2014, p. 122). I took notes during the interviews I conducted with the VP, saved the notes as text files, and archived the names of those files along with the date and time of the interview in my spreadsheet. Despite recommendations

from Miles, Huberman, and Saldaña, I did not use a Computer Assisted Qualitative Data Analysis Software (CAQDAS) application as part of this study (p. 47).

All of these artifacts and the tools the VP uses to create and manage them amount to what Spinuzzi has called “mediating artifacts” that have the power to “qualitatively change the entire activity in which workers engage” (2003, p. 38). What was curious from an outsider’s perspective was that even though the city RFI requested an education on PM software, that education was never provided in the abstract. That is, anything PM software could do was illustrated through specific details about the VP’s software. As Van Nostrand observed in his pursuit of transactional genres, “From both an institutional perspective and an individual perspective, virtually all of the interactions in the defense R&D community entail relationships that are essentially rhetorical and insistently pragmatic. Honesty of purpose is normally transparent” (1997, pp. 141–142). While it is no surprise that the RFI submission is a rhetorically charged document, it is surprising that there are seemingly no efforts to obfuscate the rhetoric. The transparent “honesty” of the document is that she first and foremost wanted to sell them her software solution. The VP confirmed this observation in an interview telling me that the RFI is issued by the city because they want to buy a software solution; she responds to the RFI because she wants to sell them her solution.

Important to the integrity of the study, the VP provided informant feedback or member checks to validate the work as reflective of the processes studied. Even though RFIs and RFPs are public documents, I wanted to use member checks with the VP to confirm she felt that her confidentiality and anonymity had been maintained (Miles, Huberman, & Saldaña, 2014, pp. 58, 63).

Visualizing frameworks & beginning data models. Fortunately, technical communication researchers have produced examples and templates for modeling activity systems. In 2009, Hart-Davidson, Spinuzzi, and Zachry presented a workshop at the Rhetoric Society of America conference titled, “Visualizing Patterns of Group Communication in Digital Writing.” The contents of that workshop would later be developed into Spinuzzi’s book-length research guide *Topsight: A Guide to Studying, Diagnosing, and Fixing Information Flow in Organizations* (2013). As the title suggests, field studies are conducted with the objective of getting the big picture of an organization’s

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operations. The activity system templates from the workshop and *Topsight* were the starting point for my visual frameworks. Activity systems are represented as hexagons with the six corners serving as numbered information nodes. The first node requires two different categories and the remaining nodes require one each for a total of seven. They are:

- Object(ive)
- Outcome
- Tools
- Actors
- Community Stakeholders
- Rules
- Division of Labor

These seven operate around the edges of the context of the activity system. I returned to my notes and the gathered data to begin the visualization of the VP's activity system. With some adjustments, I believed most of my work could be positioned within these seven recommended portions. I populated two activity systems – one representing a city government perspective and one representing the V.P.'s software company for the RFI process. They are represented in Figures 1 and 2 below.

In both figures, I populated information in the Rules section with the deadlines and software application requirements from the city RFI. The RFI identified with whom the VP was corresponding and that information along with who would be tasked with what specific work, which completed the categories of actors, community stakeholders, and information

about divisions of labor. I decided to separate Tools from the different genres the VP produced using those tools. Influenced by Spinuzzi's (2008) work with both activity theory and ANT, the actors were defined as both human and nonhuman actors imbued with agency to alter the communication network. From a technical communicator's perspective, the exercise of creating these diagrams was useful because the process was a lesson in organizing and distilling complex systems.

The next stage, according to *Topsight*, is to begin diagramming connections between activity systems to create activity networks. The networks reveal the various ways that the systems overlap or are chained together (2013, pp. 228–230). For example, the rules governing both systems overlap a great deal. My future plan for modeling the study's data was to create more activity systems and put them in conversation with a larger and growing activity network. I would create a new activity system detailing the VP's process for generating her list of vendor questions she was allowed to submit to the city and add that to what would have been a growing network. Similarly, different iterations of the RFI submission could be added to the network and with iterations represented as activity systems. Again, the study would become vastly more complex once the RFP was issued by the city. Before proceeding, I emailed the two activity systems to the VP along with supporting literature on the diagramming process.

Activity systems diagrams: A brief rhetorical analysis. Visual documents, such as those in Figures 1 and 2, communicate through a hybrid interaction of

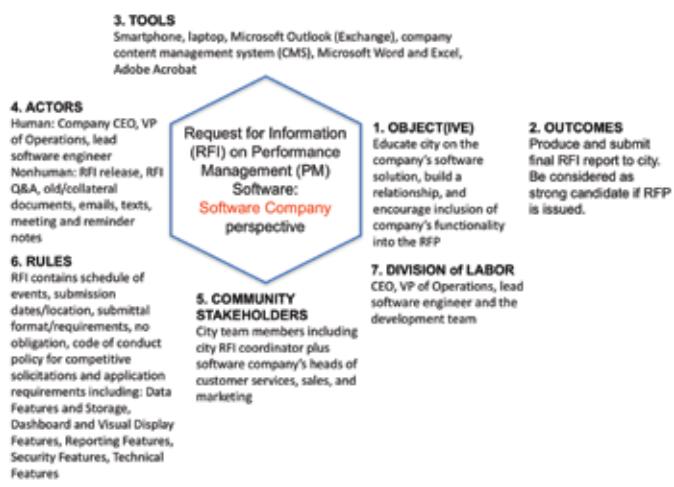


Figure 1. Activity system diagram from the software company's perspective

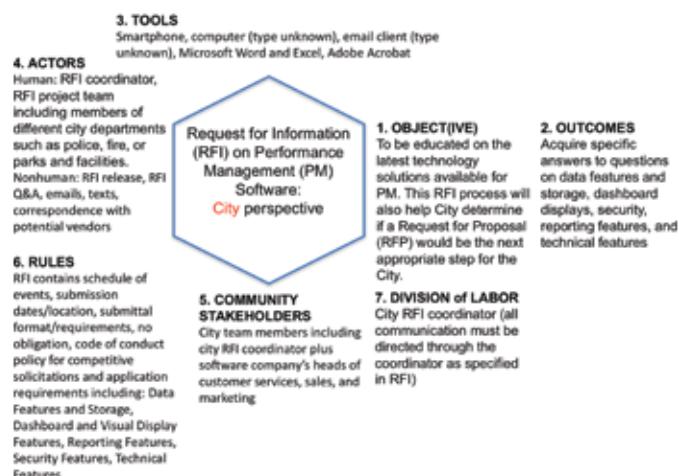


Figure 2. Activity system diagram from the city's perspective

text and image. A rhetorical analysis of the figures based on audience, purpose, and the conventions employed in the visuals makes a critique of the activity systems possible. Discussing the “slippery topic of audience,” Bosley (1994, p. 296) reminds us that “actual readers have values, beliefs, perspectives, knowledge, authorities, politics, expectations, and constraints that enable or limit their ability to read and use technical documents” (p. 296). That is, audiences are automatically bound up with social, political, and ethical concerns that technical communicators, including those designing visual documentation, may or may not be aware of. Even though my immediate audience was the VP, I was also aware that the VP’s colleagues, audience members I would never meet, may one day see or attempt to use these visuals.

In a rhetorical analysis, audience and purpose are linked naturally. While I was not attempting to persuade the VP in a more conventional sense to, for example, buy a product or service, the purpose of these figures was that they would function to provide an accurate and useful rendering of her processes. Foss (1994) actually recommended the term “function” instead of purpose in her “rhetorical schema” for evaluating visual imagery (p. 215). Once the function of an image has been determined, in this case capturing and rendering the fluidity of the VP’s processes, the “critic’s concern here is with the various stylistic and substantive dimensions in the image” (p. 216). In other words, it was clear what the activity diagrams were supposed to do, and it would be the content in combination with the conventions deployed in their visual display that would determine their success.

The VP did not dispute that the activity diagrams attempted to account for all audience members involved, including herself. She also emphasized the importance of diagramming objectives as well as the desired outcomes from communicating with a potential client. Ultimately, however, the VP would be critical of the diagrams for several reasons but primarily because they required her to learn a new means to visualize processes when an existing standardized system was already available. This audience’s values and beliefs held open standards in the highest regard. Additionally, the diagrams needed to be more easily editable and shareable, especially when a group of users may be scattered around the world and using different computing platforms. In the VP’s estimation, the diagrams failed in the limited ways they

invited audience members to participate with (re)using them. After a number of emails in which I attempted to explain what were dubbed academic and proprietary research models, I received an email with the following subject line: “Please. Use. UML.”

Process Modeling Notation and Technical Communication

The VP’s email could be dismissed as glib, but I contend that it reflects the level of frustration we reached regarding initial attempts at data visualizations for the evolution of the study framework. I had last used UML in the early 2000s, and it was not uncommon for requirements specifications for our team’s larger software projects to contain a dozen or more UML diagrams capturing system workflows such as trusted IP and digital certificate validations as well as encryption and decryption sequences. But, I was genuinely surprised by the advancements in the standards and the technology available to develop with UML when I returned to it. UML is a standardized modeling notation supported and controlled by the not-for-profit consortium Object Management Group (OMG). The OMG touts UML as the “*lingua franca* of software development” and cites large government and private organizations that rely on it to visualize the many operations a software system can support (Watson, 2008, p. 2). A major milestone came at the end of 2004 when the UML standard moved from version 1.4 to UML 2.0 (as of this writing, UML is in version 2.5). The 2.0 version included:

13 distinct modeling notations ranging from high-level use case diagrams, which depict the interactions and relationships between (human) actors and major business functions, through to low-level object diagrams which capture instances of individual data objects, their constituent data elements and values, and their relationships with other data objects.
(Russell, van der Aalst, ter Hofstede, & Wohed, 2006, p. 1)

In other words, UML was expanding in ways that could account for multiple actors across complex communication networks. A modeler now had the ability to demonstrate the dynamic behavior of an activity system by showing collaborations among objects and actors and changes to the states of those

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objects. Today, “UML groups together a large number of modeling techniques that were previously scattered among different domains” including BPMN, another standard that the OMG has managed since 2005 (Desfray & Raymond, 2014, p. 99).

Business Process Modeling & Notation or BPMN

Like UML, BPMN was originally conceived on a more limited scale and designed to capture business processes and communications within an organization. Also like UML, BPMN has expanded its modeling abilities so that “the graphical notation will facilitate the understanding of the performance collaborations and business transactions between the organizations” (BPMN, para. 1). BPMN is considered a process modeling notation that includes a grammar “which specif[ies] the syntax and semantics of the graphical elements in a process model and the rules of how to combine the elements” (Recker, 2011, p. 2). Since 2005, there is research documenting the use of BPMN activity diagrams for modeling these complex transactions (Russell et al., 2006), and the release of BPMN 2.0 in 2010 has stretched the reach of the standard (Recker, 2011). While UML and BPMN are separate standards, because they are both overseen by the OMG, they are managed for compatibility. This means that newer versions of UML software tools will contain the option of using BPMN when creating a new project file. As the VP reminded me, the data models I was preparing needed to be recognizable to a variety of audiences and industry standards like UML and BPMN were welcome choices. Again, by requiring my audience to adapt to my original activity system diagrams, I ignored an existing standard as well as that audience’s particular beliefs and values about sharing data visualizations.

Technical communication scholarship addressing UML has, by and large, relegated it to be a modeling tool for software development or as a means to enhance technical documentation (MacKinnon & Murphy, 2003). At best, it has been referenced as “beneficial when considering the design of what occurs on the screen and within technological systems. These [UML] diagrams are excellent for showing systems, states, and task processes related to these systems and states” (Potts, 2008, p. 2). Across a number of conference proceedings, articles, and finally a book-length project on alternative mapping techniques for studying “social web ecosystems,” Potts (2010, p. 1) consistently advises UML “is not intended

to be a way to understand an entire ecosystem of actors participating in ordinary activities” (2008, p. 2). That claim enables Potts to advocate for the use of actor-network theory (ANT) and what she terms ANT diagrams or maps. As described by Potts, the “major tenet of ANT is that all participants, whether they are human or non-human, have equal agency to affect any given situation” (2009, p. 34). The ANT diagrams are developed to trace the distribution of agency across a web of actors assembled around an event. Potts’s point of reference for UML’s inadequacy is Fowler’s *UML Distilled: A Brief Guide to the Standard Object Modeling Language* (2003) and she cites Fowler consistently across her publications. As a 2003 text, Fowler’s work pre-dates UML 2.0 and the current advancements by the OMG in modeling standards, including OMG’s management of BPMN standards. In fairness, though, the rise of BPMN has been swift. According to Recker (2010), “No other notation has seen such an uptake in such a short time as BPMN has” (p. 182). Certainly, my own initial attempts to visualize the VP’s processes did not make use of the OMG standards.

In my conversations and email exchanges with the VP, I realized that I needed to update my own outlook on UML and now BPMN as potential modeling options as well as research more current sources on UML and BPMN. In a 2010 issue of *Technical Communication*, Damrau reviewed *The Process: Business Process Modeling Using BPMN* (2009) and *BPMN Method and Style* (2009), the latter now in its second edition. Damrau asserts that:

Business process modeling is becoming more prominent for documenting business and system processes. Business systems analysts and technical communicators are the professionals who should be well-versed in the structure of business process modeling (BPM) and the graphical notation or business process modeling notation (BPMN) that accompanies it. (p. 333)

For this project, I acquired Silver’s second edition *BPMN Method and Style* (2011) as well as the second edition of Podeswa’s *UML for the IT Business Analyst* (2010). I relied heavily on online BPMN resources to guide my new efforts (Modelio, “Tutorials”; Visual Paradigm, “Introduction to BPMN”; White, 2006). What all of these sources emphasize is that BPMN

Table 1. Basic BPMN components created with Modelio

Events				
Activities				
Gateways				
Flow/ Connectivity Objects				

has emerged as a result of a “clear need for a modeling language for business processes which could be expressive and formal enough but easily understandable also by final users and not only by domain experts” (Chinosi & Trombetta, 2012, p. 124). When it comes to the complex problem solving required of many of

today’s technical communicators, BPMN provides a means to visually capture and then easily distribute proposed solutions to the wicked problems the workplace presents. Silver (2011), however, does caution that because BPMN diagrams look like “traditional flowcharts” their “outward familiarity” may mask

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some of the complexity of diagramming with BPMN (p. 3, emphasis in original). Podeswa (2010) notes that business process diagrams produced using BPMN make use of a “rich symbol set [that] can model complex and subtle workflow requirements” but that a more nuanced use of that symbol set can take time to learn (p. 64). Table 1 catalogs some of the basic elements used in BPMN models.

Even though the VP would not be using the activity system diagrams originally generated to document any of her company’s practices, nor would she be sharing them with her colleagues, the discussion generated by those models spurred a reevaluation of OMG standards. The remainder of the article will illustrate the use of BPMN to model new diagrams as well as reflect on the importance of acquiring proficiency with modeling languages in order to better reduce disconnects between teaching and practice.

Open source UML/BPMN data modeling via Modelio

Advancements in the open source software community have produced stable software for a growing number of markets, and that includes process modeling notation applications. Wikipedia’s entry comparing BPMN tools based on platform, version support, and licensing is a useful resource for reviewing tool options (“Comparison of business process modeling notation tools”). For this

study, I turned to the open source application Modelio to revise the VP’s models. Modelio requires Java to run, and it has Linux, Mac, and Windows versions. The version of Modelio used for this project (version 3.2.1) includes the option to build a BPMN diagram when launching a new project. With several hours of working with the application, including viewing and referencing tutorial materials, I was able to work together a new activity network and send it to the VP (see Figure 3).

While the grammar of this initial BPMN model would surely benefit from additional revision, the draft received an enthusiastic response from the VP and it is shown here to visualize connections among the basic BPMN elements. As she pointed out, revising a process model is much easier when everyone involved is working from a standardized notation and has an (albeit basic) understanding of the grammar. First, the activity network is setup as a *pool* that contains the original activity systems representing the city’s and the VP’s perspectives. These systems reside within the pool as *swim lanes*. Modelers use swim lanes to represent the activities of any number of participants and BPMN diagrams often contain several swim lanes representing actors such as customers, the company, a computer server, and product distributors. The circular elements represent different types of *events* including start, intermediate, and end events. Events can be assigned

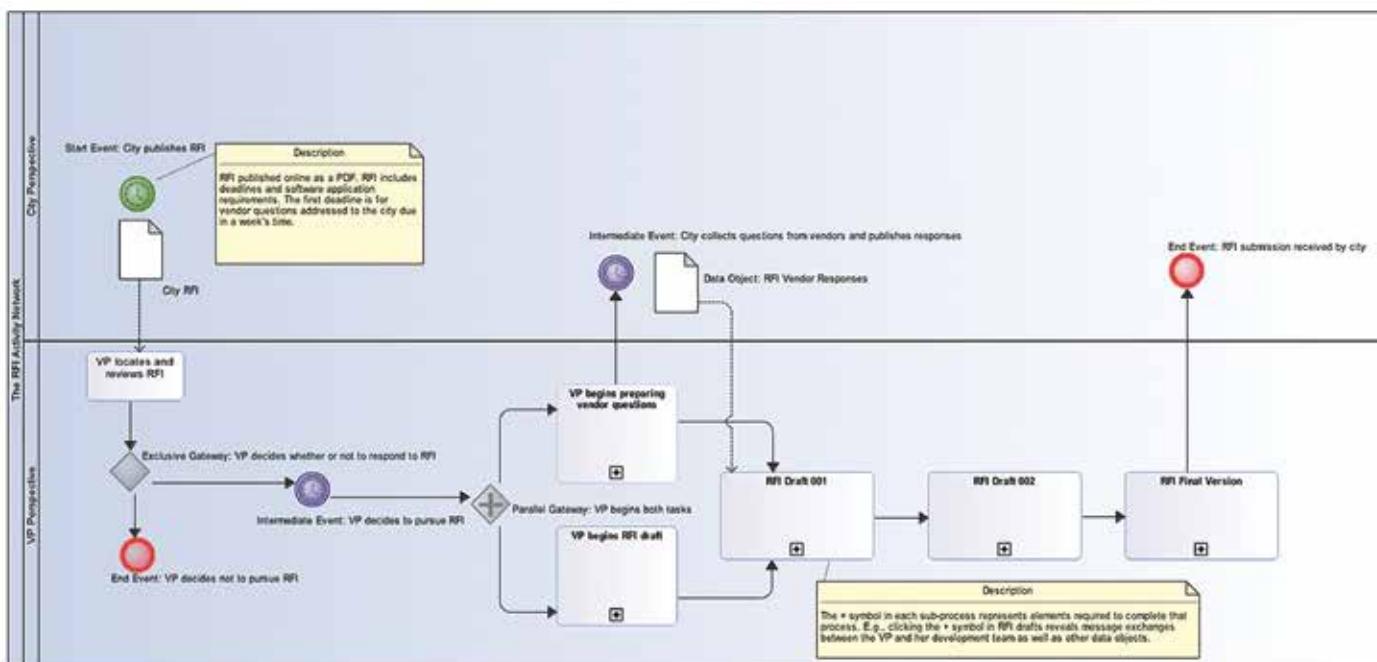


Figure 3: The RFI Activity Network modeled with BPMN using Modelio

different type attributes and the start and intermediate events shown in Figure 3 are designated as timers to signify the different RFI deadlines. The diamond-shaped elements represent different *gateways* for regulating process flow. For example, an exclusive gateway indicates a choice with only one information flow continuing on. Other gateways, such as parallel gateways, indicate that multiple processes can be in motion simultaneously. The rounded rectangles in the figure stand in for activities performed during a process. Activities are either a specific *task* or a type of *sub-process* activity. Above, the VP's review of the city's RFI is represented as a single, discrete task. The other activities in the diagram contain a "+" symbol indicating that there are sub-processes that make up the activity. Clicking "RFI Draft 001," for example, would reveal the underlying elements that make up that sub-process, including the VP's communication flows with her development team and a draft of her RFI submission represented as a *data object*. Data objects represent different types of data produced or stored as part of a business process. Other data objects in this diagram include the published RFI and the city's published responses to the vendor questions, both in the city's swim lane. Future versions of this model that attempt to visualize the more complex RFP process may benefit from moving actors, such as the company owner or a lead developer, into their own swim lanes. As Winsor (1999) reminds, "complex organizations almost always encompass several subsidiary activity systems with different interests" (p. 201). Sub-processes shown above contain separate business processes, but when actors, such as the owner, become more involved across multiple information flows, they will move to the fore of the diagram.

Part of the power of BPMN diagrams is that they are shareable among users. BPMN 2.0 uses XML to facilitate diagram exchange and collaboration across many notation tools (Silver, 2011, p. 9). Also, the symbols representing the different elements in a process model are standardized and widely recognized by developers, analysts, and other knowledge workers. As academics providing instruction for future technical communicators, we should be cautious of advising students to model systems with proprietary visualizations. For example, reflecting on the construction of her ANT maps, Potts (2014) advises that after the different "nouns," or actors in a network, have been identified, the "experience architects" developing

a map should devise visual "stencils" to stand in for the nouns or the actors (p. 35). The unique icons are needed because "different situations require the use of different kinds of stencils. For example, a situation like a terrorist attack requires a stencil that looks like a bomb, while a situation like a new movie release might require a stencil that looks like a film" (p. 35). Potts goes on to discuss using connecting lines of various thicknesses between the actors to approximate the amount of contact between two actors. A thicker line signifies more contact. Indeed, there may be instances where modeling a new network of communication requires the creation of specialized symbols. With more recent advancements in UML and BPMN 2.0 standards, I would argue for attempting these visualizations with standards-based processes first. Standardization does not necessarily have to mean rigidity—that is, rigidity built into the tool that would prevent modelers from respecting the nuances and fluidity of the type of work knowledge workers perform. It should be noted, too, that most modeling tools have the ability to import custom images and contain freehand drawing and shape tools.

Concerns regarding standards-imposed rigidity, however, are not unfounded. Process modeling has its roots in manufacturing where material flows and production schedules were mapped as a means to increase efficiency and a company's bottom line (Recker, 2008, pp. 11–13). Models for these processes are akin to what Spinuzzi (2003) critiqued as "formalization methods" that "tend to assume some sort of structure that underlies the work of a range of workers, a structure that can be investigated, modeled, and repaired in such a way as to solve the workers' general problems" (p. 19). The issue, according to Spinuzzi, is that these methods extend a "victimhood trope" found in fieldwork-to-formalization studies that ultimately devalue a worker's agency (p. 13). Companies should work to strike a balance between formalizing aspects of their business processes without replacing the "local, idiosyncratic, or contingent solutions" developed by workers in their responses to emergent tasks (p. 21). While the VP and her different, sometimes idiosyncratic, strategies for approaching her work were not in need of rescue of any kind, I wanted to remain mindful of visualizing the very fluid and nuanced portions of her workflow in an overly reductive form. Again, with advancements in the BPMN 2.0 release, there is not only greater flexibility for modeling but also an interest in expanding on the

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context in which a process occurs. For example, “many process models also include information regarding the involved data, organizational/IT resources and potentially other artifacts such as external stakeholders, performance metrics, context factors and other related information” (Recker, 2011, p. 13). Recognition of these external influences and “extrinsic drivers” that may influence processes are the “drivers for flexibility [that] can be found in the context of a process and may include among others time, location, weather, legislation or performance requirements” (Rosemann, Recker, & Flender, 2008, p. 47). Increased flexibility within the UML and BPMN 2.0 standards can mean more nuanced data visualizations that resist mere fieldwork-to-formalization models.

In short, even amateur attempts at using current UML and BPMN tools revealed several reasons technical communicators may wish to explore these tools for their own data visualizations:

- OMG managed standards are recognized by many knowledge workers, including analysts, engineers, and executives
- XML-based file formats are shareable across teams for collaboration
- Drill down option for sub-activities to account for greater complexity of systems and networks
- Relationships among data and actors are visualized across systems
- Free/open source UML/BPMN authoring tools are stable enough for industry use

Practitioner results: Business analyst or technical communicator?

From a practitioner standpoint, I felt the need to question the VP about the relationship between the changing roles required of a technical communicator and the job description of a business analyst or those often tasked with analyzing, capturing, and modeling business and/or software processes. This is not, of course, a new conversation. A quick search of the TechWhirl list-serv archives (<http://www.techwr-l.com/archives>) reveals a number of discussion threads related to business analysts including “What is a business analyst?” and “Tech Writers Turned Business Analyst.” In another thread titled, “Business Analyst vs. Tech Writer,” the author of the post was updating his résumé to include job responsibilities from his most recent positions and those found in his new technical writer position. When he entered some of

the key words from his job description into the popular job search website Dice, many of the results that came back were for analyst positions. The author quipped that the companies he has worked for “got a tech writer and an analyst for the price of a tech writer” (Barrow, 2007). Indeed, many analyst responsibilities do not sound foreign to technical communicators.

The International Institute of Business Analysis maintains and publishes the *Business Analysis Body of Knowledge* (BABOK) now in its third version and available in five languages. In their cataloging of the many responsibilities an analyst may have, they include:

Business analysts must analyze and synthesize information provided by a large number of people who interact with the business, such as customers, staff, IT professionals, and executives. The business analyst is responsible for eliciting the actual needs of stakeholders, not simply their expressed desires. In many cases, the business analyst will also work to facilitate communication between organizational units. (BABOK)

From the perspective of the VP, the proverbial ship has sailed. Technical communicators that are unprepared or unwilling to enter an organization and navigate their complex business processes as well as work to understand the processes of their potential customers and current clients will find themselves relegated to fewer and smaller tasks. Of course, the person providing this feedback is someone who has herself risen to the position of Vice President. The VP’s job description is vast and it is presumptuous to assume that all practitioners in our field aspire to VP-level jobs. But, technical communication practitioners should not be surprised to see more demand for business analyst skills. In a recent “My Job” profile written for *Intercom*, “Jill’s” new technical communication position has a number of new requirements, the first of which is knowledge of “business development and processes” (Woelk, 2015, p. 32). Because our field does lobby frequently for more status among our industry colleagues and has published extensively about our own “power and legitimacy,” these increased requirements can be viewed as a victory (Kynell-Hunt & Savage, 2003, 2004). Our field also claims that technical communicators should be involved earlier in business activities of many kinds, such as the development cycle of a new software product or building

a new website. Not only do we want to be involved early, we want to be involved for the duration of the project, including testing and even subsequent product versions. We have made these claims based on our strengths as symbolic analytic workers and those same analytic skills for complex problem solving are those frequently associated with analysts. This is not a call to clamor for territory among business analysts but to recognize how the boundaries of the fields push against each other and, at points, overlap.

Technical Communication, Globalization and the Importance of Standards

As noted, Damrau suggests that both technical communicators and business analysts “should be well-versed” in BPMN because of its ability to show “the complete end-to-end process-oriented view of a business process” (2010, p. 333). As she summarizes, a BPMN visualization displays “the steps and actors (humans or systems) in a process, describes what information is needed when, and determines where transfers (handovers) take too much time” (p. 333). Because practitioners wrestle with new communication challenges brought on by globalization, standardized models for capturing these complex processes could play a key role in bridging gaps formed from international and cultural communication differences. The VP’s company headquarters are in Europe, and her role was to expand the company’s market share to the U.S. Granted, the communication differences between two Western cultures are relatively small when compared with corporations that have colleagues and customers in China, India, Europe, and the U.S. The V.P. was adamant in our interviews that standards matter, especially cross-culturally.

Discussing the challenges of developing successful approaches to communication design, Getto and St. Amant suggest that the “trick becomes finding a method that can facilitate communication design practices for global audiences” (2014, p. 25). Standards-based models like BPMN should be among the “tricks” up a technical communicator’s sleeve. The OMG that maintains BPMN and UML is an international standards organization and an international community of researchers publishes much of the scholarship available on BPMN. Writing from the Bucharest University of Economic Studies, Geambășu (2012) offers her review

of BPMN and its abilities to help address “a growing interest of organizations in improving their business processes in order to be more competitive in a globalized economy” (p. 637). Italian colleagues Chinosi and Trombetta (2012) note that to “share a diagram across multiple domains and using many different technologies and softwares is seen as big challenge” (p. 124). In their article on the standard, they conclude that BPMN is now the de facto means “for representing in a very expressive graphical way the processes occurring in virtually every kind of organization” (p. 124). Finally, at the outset of his book, Silver (2011) is adamant about the important role standards play in modeling:

The most important thing about it is that it is a standard. . . . That means it is not owned or controlled by a single tool vendor or consultancy. You pay no fee or royalty to use the intellectual property it represents. Today, virtually every process modeling tool supports BPMN in some fashion. . . . A key benefit of a process modeling standard is that understanding is not limited to users of a particular tool. The semantics are defined by the standard, not by each tool. (p. 3)

Given the emergence of standards-driven process modeling and the possibilities for a specific standard such as BPMN to assist technical communicators in addressing the challenges of international communication, below is a list of suggestions for practitioners interested in exploring BPMN:

- Research and read free documentation on BPMN on the bpmn.org website. The documentation section contains basic overviews and the resources section contains free videos and tutorials of BPMN in action.
- Download and try one of the many free UML/BPMN tools. This project used Modelio from modelio.org and the site’s Quick Start Guide takes the user through download and installation all the way through project creation. As of 2012, Microsoft Visio now supports BPMN 2.0. If technical communicators are already accustomed to working in Visio, this may be a friendlier environment to experiment with BPMN.
- Reevaluate job descriptions in relation to the actual or predominate tasks performed as a technical communicator. As the demands of work evolve,

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have those demands converted into work typically associated with business analysts? If so, it may benefit a technical communicator to compile those tasks and request an updated job description or change of position in order to better reflect the work performed.

- Using a standards-based process model such as BPMN, attempt to model a business or systems process that technical communicators either participate in or are in the midst of developing. Consider the value the diagrams may bring to all of those involved, especially an international contingent. Circulate the model among those involved with the intent of providing a new perspective on the process.

Conclusions: Implications for Teaching and Practice

Returning to Rude (2009) and her observation that “[t]he connection between pedagogy and practice is close, especially when pedagogy concerns undergraduate or master’s-level preparation for practitioner purposes” (pp. 182, 186), this article closes reflecting on this (dis)connection. Her article mapping the research questions for the field of technical communication indicates renewed unease for how we prepare students for nonacademic writing with a specific mention of teaching students “how to present results in ways that are ethical, usable, and appropriate for the need” (p. 195). Among Rude’s maps are overlapping spheres of pedagogy and practice, containing “information design” and “development and management” as the two key subcategories crucial to a practitioner’s success (p. 183). Again, according to Spilka (2009), where we should have an overlap, we instead have a “disconnect” (p. 219). Working with the VP, even in this admittedly small study isolating one RFI, has pushed me to address what may be my own contributions to the disconnect.

My strategy so far has not been to cut theoretical texts exploring genre and activity theory or actor-network theory from research methods reading lists. Because “[q]ualitative sampling is often decidedly *theory driven*” the texts are important inclusions (Miles, Huberman, &, Saldaña, 2014, p. 31, emphasis in original). Students should learn to question, “what work the theory does for us” (Winsor, 1999, p. 201). Much of the scholarship cited in this article represents

elegant deployments of a theory—that is, a specific methodology set out to drive a particular method of qualitative sampling. Students benefit from contending with the complex relationship between a theory driving a particular method, but I have found that students often misunderstand the basic difference between a theory or methodology and a method. In other words, before we study them working together, we start by understanding them separately. Citing Sullivan and Porter (1997), Spinuzzi offers an important distinction between method and methodology that I am mindful of sharing with students. Specifically, “they express quite different things. A *method* is a way of investigating phenomena; a *methodology* is the theory, philosophy, heuristics, aims, and values that underlie, motivate, and guide method” (2003, pp. 6–7, emphasis in original). The terms are not interchangeable. Graduate students in particular will often begin a class outfitted with their favorite methodology in mind and mistake that methodology as a means in and of itself for conducting a study. If we agree that “[o]ur research questions demand a greater variety of methods” then we will need to be strategic about the instruction of those new methods including qualitative approaches (Rude, 2009, p. 177).

Resources like Koerber and McMichael’s primer for qualitative sampling is a good option but so are chapters from Miles, Huberman, and Saldaña (2014) and Saldaña (2013) to show students study methods as distinct from methodologies. Finally, Smagorinsky (2008), in his often cited article on the frequently overlooked importance of the role the methods section plays in a qualitative study, is a good addition to a graduate methods course. He advises: “The Method section, then, has evolved to the point where, in order for results to be credible, the methods of collection, reduction, and analysis need to be highly explicit. Further, the methods need to be clearly aligned with the framing theory and the rendering of the results” (p. 392). One of the best ways to reinforce these points is to read work, such as the scholarship cited here, that demonstrates a strong methods section.

Students should also understand that methodologically complex texts with data visualizations that are not recognized as industry standards may not be appropriate models for their work if their next move is to enter industry. The blunt, perhaps even crude, question here is whether or not methodological complexities such as activity theory, genre theory, and actor network theory are worth their efforts. How

useful, or even reliable, are they for the field? Those questions are for future projects, but Rude's (2009) original concern over preparing undergraduate and master's-level students for the workplace suggests that we should have candid discussions with students about audience for each of the different texts we employ in the classroom. For example, in an otherwise laudatory review of Spinuzzi's *Network: Theorizing Knowledge Work in Telecommunications*, Yeats (2010) writes:

Clearly, Spinuzzi's target audience is **not** made up of telecommunications executives, but it's not unreasonable to say that the recommendations for workers and managers in the final chapter of *Network* could be used to develop strategies and policies that help workers and managers become more effective and efficient in their work. I fear, however, that no VP at Verizon or AT&T will pick up a copy of *Network* at the airport bookstore. (p. 321, emphasis in original)

And that's fine; even academics as well published as Spinuzzi are not (generally) writing for traveling executives passing through O'Hare. Spinuzzi's deft deployment of activity theory and ANT in *Network* has received widespread acclaim in academic communities and it challenges graduate students at all levels. But, my mistake with modeling data for the VP in my study was thinking that I was writing for her (an executive audience) when I was writing and modeling with more academic tools (perhaps) better received by an academic audience. The hexagon models representing activity systems offered by Hart-Davidson, Spinuzzi, and Zachry (2009) were also not necessarily designed for the business process modeling I was attempting to use them for. But if that is the case, how do we teach our students standardized data visualizations and modeling in our research methods courses so that will have value outside of the classroom? Again, current qualitative methods sourcebooks are effective points of departure.

Miles, Huberman, and Saldaña (2014) divide visual displays into matrices and network models. The tabular form of matrices represent data in standard rows and columns that "collects and arranges data for easy viewing in one place, permits detailed analysis, and sets the stage for later cross-case analysis with other comparable cases or sites" (p. 111). Network displays are visual models that resemble UML and BPMN diagrams. They are a

"collection of nodes or points connected by links or lines that display streams of participant actions, events, and processes" (p. 111). The nodes visualized in the many samples offered by Miles, Huberman, and Saldaña are often circles, ovals, and rectangles representing actors or attributes enmeshed in a network. Such networks are recommended for "a case-oriented approach that recreates the 'plot' of events over time, as well as showing complex interrelationships between variables" (p. 111). Again, the authors recommend a number of CAQDAS applications for qualitative projects, most of which have the ability export visual displays of case data. Microsoft applications such as Word, Excel, and PowerPoint will also suffice for creating matrices and networks.

However, those modeling larger projects intended to capture business processes should consider selecting a UML/BPMN tool. Selecting a Microsoft product "is fine for initial descriptions, which require easy, flexible usage, but quickly turns out to be counterproductive when managing a structured whole over time" (Desfray & Raymond, 2014, p. 230). Again, the latest version of Microsoft's Visio does support BPMN 2.0 and, provided that a practitioner or student has access to it, Visio may offer a more familiar interface for exploring process modeling. But, as a free, open source application, Modelio is an easy way to get students producing data models that are scalable and standards-based. Regardless of the specific application selected, "BPMN support is available in most UML tools" (Desfray & Raymond, 2014, p. 230). Technical communication instructors should consider introducing these modeling tools to their students and at least give students the option of modeling their next project using these standards-based notations. With strategic adjustments to our pedagogy, we can better prepare students to visualize complex networks in formats that are easily shared and recognized by a large, professional audience.

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Manuscript received 13 August 2015, revised 6 April 2016; accepted 15 April 2016.

East Meets West on Flat Design: Convergence and Divergence in Chinese and American User Interface Design

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Abstract

Purpose: This study is designed to examine two design approaches: skeuomorphism and flat design, in both American and Chinese contexts. Questions explored include, What underlines this new design trend in American vs. Chinese cultures? How has this new design emerged? How will it evolve in the future? What culturally, underwritten aesthetic and rhetorical principles are at play?

Method: Samples of user interface (UI) design are collected from both cultures and examined to compare similarities and differences wherever possible. In-depth textual analysis is used to deconstruct particular design cases.

Results: Our analysis indicates that while flat design is the new trend, skeuomorphism has its place in UI design; each design has its advantages and shortcomings; and effective design may require the integration of both approaches. Our study also reveals that designs are culturally sensitive and that each particular design is contextualized and rhetorical. Flat design's popularity in the Chinese context has its unique rationale due to social, ideological, cultural, and linguistic reasons.

Conclusion: Savvy designers combine professional taste and culturally sensitive perspectives to produce effective designs that work for their particular contexts.

Keywords: user interface design, flat design, skeuomorphism, Chinese UI design, Chinese element

Practitioner's Takeaway:

- Skeuomorphism and flat design are not mutually exclusive. They are both useful in their own right.
- Flat design and abstraction should be used with moderation and a culturally informed sense.
- Any design should be globalized in that it incorporates universal elements and allows culturally universal affordances so that it can be localized within any particular geopolitical context.
- A good design should be localized to its particular cultural context. Designs with localization capabilities will allow cultural affordances to enable contextualized user interfaces.

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Introduction

User interface (UI) design has long grappled with the struggle to identify the most effective interface presentations. Over the last few decades, since the advent of graphic user interfaces (GUI), UI design has predominantly subscribed to a skeuomorphic approach (i.e., real life mimicking). Over the last few years, however, UI design has been evolving toward a more flat design (more abstract representations). This shifting trend in UI design (and the underlying philosophy and perception about what constitutes intuitive user interfaces) has commanded attention, and rightfully so, from UI designers, because the ultimate purpose behind such a shifting trend is to identify the most effective interface design with the greatest affordances (design qualities that lead users to intuitively select the correct action).

The focus of our study, therefore, is two-fold: 1) to examine the differences as well as respective advantages and disadvantages of both skeuomorphic and flat design, with an emphasis on the flat design approach that seems to dominate the UI design world today; and 2) to explore the various factors—social, rhetorical, cultural, and ideological—that influence designers' and users' aesthetic orientations and perceptions of intuitive interface design that have led to the shift in the current UI design trend. In examining Part 1 of our research focus, we will use contemporary UI design samples (computers, smart phones, user apps, icons, logos, etc.) in both the US and China in our attempt to deconstruct the current trend toward flat design. In exploring Part 2 of our research focus, we will examine UI design in the Chinese context in our attempt to understand what unique cultural factors are contributing to the popularity of the flat design approach.

We will first define flat design within the two different cultural contexts and discuss its respective visual and cultural characteristics. In-depth analysis of Chinese interface design samples will be conducted to ensure the validity of our findings. We will analyze certain relevant features of the traditional Chinese culture that account for such a new trend in design. We will delineate this analysis from several significant aspects, including, for example, philosophy, painting, character formation, and social status. With an in-depth analysis of such social, rhetorical, cultural, and ideological factors that drive this new trend toward flat

design, we hope to identify possible directions for the evolution of flat design from the perspectives of cultural convergence as well as divergence.

Rationale

It is our contention that UI design informed exclusively by one or the other design approaches—whether it's skeuomorphic or flat design—may not yield the most effective or sustainable results. It is also our contention that what is more important is that UI design is contextual and dependent on its particular cultural and rhetorical situation. Only design approaches informed by sound intuitive and logical sense as well as a thorough understanding of the cultural, ideological, and rhetorical contexts of the use situation will render the interface design truly effective.

A study with such a focus, we believe, is relevant to the field of technical communication in several ways. First, it's important for both researchers and practitioners in technical communication to understand what drives users' perceptions for effective, intuitive interface design. Our analysis of current UI design practices and trends, we hope, may lead to an understanding of the logic behind such perceptions, which in turn will enable UI designers to align their design logic with users' intuitive expectations. Second, we hope our study will contribute toward a better understanding of the evolutionary path of UI design trends and shed light on the underpinnings behind the transient and evolving approaches. Such an understanding is an important first step toward identifying more effective and sustainable design approaches and preventing us from repeating our past mistakes in UI design. Third, we expect our study to contribute to an increasing awareness of the role that cultural, ideological, and rhetorical contexts play in UI design.

User Interface Design: An Overview

Skeuomorphic design and flat design have been the dominating as well as contending forces in the UI design world. To illustrate the differences between the two approaches, we provide a brief definition of each and some illustrative examples for comparison. A more detailed account of the definitions and histories of these two design concepts will be provided later.

Skeuomorphic vs. flat design: definitions and distinctions

The skeuomorphic design approach, simply defined, means the mimicking of real-world objects and “using realism with faux textures, drop shadows, [and] visual metaphors” (Page, 2014, p.1). The rationale behind skeuomorphic design is that users would have less cognitive difficulty in associating icons with their intended denotations and functions. Flat design, on the other hand, adopts a minimalist approach that relies predominantly on 2-D color tiles depleted of 3-D effects. Figure 1 (skeuomorphic design) and Figure 2 (flat design) illustrate the different effects between these two design approaches. Although the differences may look subtle at first glance, a close examination reveals more substantial changes than meets the eye. Figure 1 shows Mac OS X Snow Leopard version (10.6.8) in a more skeuomorphic design. First, the overall UI design uses the desktop metaphor, with a 3-D rendition of app icons placed upright on a desktop. Second, icons themselves are mostly in 3-D form, with drop shadows, heavy textures, and more realistic looking images. In contrast, in Figure 2, the Mac OS X Yosemite version (10.10.3) displays a more flat design approach as the overall UI design lost the 3-D effect, with all icons placed against a flat background. In addition, all icons are depleted of the 3-D effect, drop shadow, and heavy texture, which are replaced instead by simple shapes and colors.

If we compare the evolution of Windows UI design, the differences are more striking. In Windows 7 (Figure 3), icons are more skeuomorphic than abstract representations. The menu icons show clear evidence of mimicking real-world objects, rendered in 3-D representations. The calendar icon on the right clearly resembles real-life calendars hung on the walls in everyday houses. However, in Windows 8 (Figure 4), icons have morphed into 2-D flat color tiles with little more than an abstract image plus a color.



Figure 1. Skeuomorphic design: Apple's Mac OS X Snow Leopard version 10.6.8



Figure 2. Flat design: Apple's Mac OS X Yosemite version 10.10.3



Figure 3. Skeuomorphic design: Windows 7 desktop



Figure 4. Flat Design: Windows 8 desktop

However, the distinctions between the two approaches go beyond mere visual representations; they reflect philosophical differences in underlying assumptions about human cognitive perception, about effective visual-meaning associations, about cultural contextualizations, and about rhetorical styles, all of which will be discussed later in this article. As Gessler (1998) has defined it, skeuomorphs are “informational attributes of artifacts which [sic] help us find a path through unfamiliar territory” (p. 230). The “unfamiliar territory” in this case refers specifically to the artifacts

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in technology. Kass and Lauer (2004) discuss two cases of media transition to illustrate the process of physical (skeumorph) and conceptual metaphors on the digital products. By demonstrating the transition from wet photography to digital pictures and from surface mail to email, Kass and Lauer argue skeumorph and metaphor play significant roles in the digital implementation of technology. As seen above, in the earlier version of Mac OS X, Apple used glass buttons on their user interface, which Ali Gajani defines as “realism” in his article “Skeuomorphism: A Design Concept on Its Way out” (2013, para. 11). Most of this realism has been clearly abandoned in the recent generation of user interfaces in both Windows and Mac OS design.

Flat design, as a response to the traditional skeuomorphic design that mimics the real-world objects, is one that “embraces a stripped-down minimalist approach and reduces textures and eschews the 3-D rendering of user interface elements” (Fichter & Wisniewski, 2014, p. 29). This design, as we have seen on Apple’s new systems such as iOS 8 and OS Yosemite, renders icons more streamlined, simple, and abstract yet without sacrificing their denotative and connotative expressiveness. Although details are being minimized, the seemingly more simplistic images are exerting more direct and intense visual impact on the user’s sensory and cognitive system, thus effecting more powerful visual-meaning associations.

UI design: the Chinese case

With the increasing trend toward abstract and simple computer interface design in the American culture, Chinese interface designers are catching up with interesting perceptions of this new trend called flat design. What underlines this new design trend, however, differs in these two cultures. How this new design has emerged, how it will evolve in the future, what culturally underwritten aesthetic and rhetorical principles are at play, etc., are thus worthwhile issues to explore.

While it’s easy to just assume that similar rhetorical and cultural principles are underlining the flat design practice in both cultures, it would be remiss if we did not at least deconstruct such rhetorical and cultural underpinnings, thus depriving ourselves of this opportunity at a better understanding of this development. As Cynthia L. Selfe and Richard J. Selfe, Jr. (1994) assert, social spaces are where “cultures meet, clash, and grapple with each other” (p. 482) and

are never “ideologically innocent or inert” (p. 485). With globalization being an inalienable part of any technological development, it’s imperative that interface design for computers and apps incorporate more global awareness. Understanding different cultures and cultural convergence are key to any successful interface design.

In our analysis, therefore, we hope to deconstruct the changing trends in UI design and delineate what underlies such changes. Further, we hope to uncover some of the cultural, ideological, and rhetorical forces that have contributed to the changing trends.

User Interface Design: The Past, the Present, and the Future

After years of domination in the UI design world until as recent as a couple of years ago, skeuomorphism is giving way to flat design. Apple didn’t launch its new operation system, OS Yosemite and iOS 8, until 2014. A consistent theme in recent reviews on the design patterns of this system is “flat” (Fagioli, 2014; Ong, 2014; Reschke, 2014; Smith, 2014). This flat design pattern is replacing skeuomorphic design and gaining increasing popularity. Nevertheless, both flat design and skeuomorphism are widely used in current designs of the user interfaces, icons, and logos of many name-brand products.

Will flat design take the place of skeuomorphic design? The debate between skeuomorphic design and flat design is still ongoing in the field of industrial UI design. In this section, in addition to analyzing skeuomorphic and flat designs from a rhetorical perspective, we will also summarize their respective pros and cons. By comparing the features of the two design models rhetorically, we hope to shed light on the evolution of design patterns and their future directions. Examples of both designs are used to illustrate our argument.

Skeuomorphic design: features and problems

Skeuomorphism is a design style that takes design elements and cues from the real world. According to Wikipedia, the term *skeuomorph* originated from the Greek: *skéuos*, σκεῦος (container or tool) and *morphe*, μορφή (shape). It has been applied to material objects since 1890 and is now often applied to digital venues, such as interface and Web design. Apple and Microsoft seem to have favored skeuomorphic design dating back to the beginning of OS and Windows. With a new generation of technology, such

as iPhones gaining popularity among users, iOS 6 and earlier versions of the system demonstrated a high level of skeuomorphism. In order to allow the maximum affordances for their devices so that users can use them with the least amount of difficulty, designers introduce a lot of textures, shadows, and image assets to add verisimilitude. The 3-D effect is another feature in interfaces with skeuomorphic style because it makes the interface look more real than a flat object. Details are focused to enhance the sense of verisimilitude, too. Take iBook 3.0, for example—two features of the iBook design are typical examples of skeuomorphism: Wooden texture is used to mimic that of a real bookshelf, while flipping book pages with sound effects mimics users' reading activity.

The interfaces with skeuomorphic design are exquisite, and each application looks like a piece of artwork; however, with the advance of technology, skeuomorphic design yields several major problems. First, the excessive obsession with details results in cluttered designs. To pursue the effect of being real, designers tend to adopt excessive texture details, some of which are simply useless. As designer and coder Sacha Greif (2013) explained in Loren Brichter's interview: "Gaudy textures are just a visual design problem. . . . I hope they tone it down."

Second, gaudy textures lead to another problem of skeuomorphic design: Over-sized textures and image assets occupy storage. With the development of high-resolution display, demands on the quality of image assets increase, correspondingly. Therefore, high-quality image assets take up storage even more than before.

Third, icons and interfaces with skeuomorphic design are hard to unify because objects in the real world take varied forms and textures. The more real skeuomorphic icons and interfaces are, the harder it is to unify them in an operational system.

A fourth problem with skeuomorphic design is the cultural and temporal barriers. Some skeuomorphic icons mimic the objects that are widely used in one culture but unfamiliar to users from another culture. For example, as Rau, Plocher, and Choong (2012) point out, the US mailbox has been used as the icon for email, but a mailbox in Japan looks more like a trash can to US users (p. 71). A flip clock is commonly used in some cultures but is rarely seen in China, so when some interfaces of clock application in China use the image of a flip clock, it results in cognition issues

for Chinese users. Frequently, a culturally indigenous interface design may mislead users from other cultures. For example, the image of Archive in iOS mail adopts the common U.S document box for representation; however, some Chinese users tend to click that button to delete an email because the image of the document box looks more like a trash can in the Chinese culture (see Figure 5). Time is another barrier for users' perception: Some vintage designs may not necessarily recall the intended nostalgia effect but instead confuse younger users. For example, users born after 2000 who haven't seen the cassette tape may feel uncomfortable when it's used in music applications.

In recent years, the rising concept of responsive Web design has curtailed the wide application of skeuomorphic design (Müller, 2014; Greif, 2013; Asghar, 2014). Responsive Web design is a design model featuring flexible layouts that can adjust the screen size to different devices. With more and more devices connecting to the Internet, designers have focused on creating perfect Web page displays for screens of different sizes in different platforms. Responsive Web design aims at being applicable to all devices and browsers. Some scalable vector graphics

(SVGs) are needed under the principle of responsive Web design (Turnbull, 2013). Different from pixel-based graphics, an SVG is a graphic that is comprised of paths, and these paths can form shapes and drawings. By dragging the starting or ending point of the path, the SVG can zoom in and out accordingly without losing the quality of image ("Vector Graphic," n.d.). Designers try to lower the image assets, eschew shadows and textures, and approach a simple design model. It was under these circumstances that flat design emerged and gained favor among designers.



Figure 5. The third icon at the bottom, a folder box intended as the Archive icon in the US, is often misinterpreted as a trash can by Chinese users.

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Flat design: the perfect remedy?

According to some designers and critics (Turner, 2014; Kimball, 2014; Pratas, 2013; Asghar, 2014; Müller, 2014), Microsoft seems to have spurred the new design trend when it released its music player Zune in 2006. The design language focused on large typography and bright blocks of color. Even though this product wasn't successful commercially, Microsoft kept this design philosophy and formally introduced it with the publication of Windows 8 in 2012. The simple, modern-looking interface was named "Metro."

Meanwhile, Apple was still clinging to skeuomorphic design; however, in 2013, users were surprised to find a lot of flat elements in Apple's newly released iOS 7. Apple has modified its design style from skeumorphic to flat since the release of iOS 7. Reports have even identified "iOS 7 To Be 'Very, Very Flat,' with Redesigned Apple App Icons and More" (Allsopp, 2013, para. 1) to describe this new trend. The reversed attitude of Apple enhanced the wide application of flat design in logos, icons, and interfaces. As leaders in the field of Internet technology, Microsoft and Apple's design philosophies have significantly influenced the design of websites and applications. Flat design has no doubt become one of the mainstream design styles in the recent couple of years.

By eschewing the 3-D form and pursuing a flat effect, flat design adopts minimalism as its key approach in favor of bright colors, simple elements, and clean and effective typography. Skeuomorphic illustrations are replaced by abstract images. Certain elements such as textures, shadows, and some useless graphic assets are reduced. The interface looks simple and abstract. Because of the simple nature of elements in flat design, typography and color are extremely important. A key upside to bright colors and clear typography is that they attract users' focus to the content itself instead of the extraneous visual effects. Scalable vector graphics are used for icons and images; they work especially well with different screen sizes and browsers because SVGs are resolution independent, unlike pixel graphics (or raster images) whose set resolution may render them blurry when expanded to certain sizes. As Alex Danilo (2012) has pointed out, "One of the most useful things about SVG is that it's resolution independent, meaning that you don't need to think about how many pixels you have on your device, the result will always scale and be optimized by the browser to look great" (para.

5). The size of flat applications is reduced because of fewer graphic assets. The loading time of flat websites is faster without adding any extra design elements (Asghar, 2014). Because the designer can use the same color and typography system, the design style is much easier to unify, which is important to an operational system. A good example of flat design is the colorful tiles employed by Windows 8, as shown in Figure 4.

Flat design may be many designers' new favorite now, but it is not embraced by all critics and users. Some technical reviewers critique that flat design has ruined usability (Müller, 2014). No doubt, abstract images and icons may raise the difficulty of cognitive understanding in some cases. Being flat may certainly run the risk of low or failing usability. To what extent flat design is useful and conducive to usability depends on how sensible the design is, just as is the case with skeumorphic design.

Skeuomorphic or flat: where are we going?

The debate on flat versus skeuomorphic design is likely to continue for some time to come. Many websites and application interfaces have switched to flat design, rendering skeuomorphism sometimes outdated. But what exactly is the future of flat design? Will it take the place of skeuomorphism? Many critics of technology have attempted to provide answers (Turner, 2014; Kimball, 2014; Pratas, 2013; Asghar, 2014; Müller, 2014; Greif, 2013). In this article, we attempt to approach this subject from the perspectives of technical communication and rhetorical studies.

Flat design may be a new concept, but the fundamental principle it's based on—minimalist design—is not new to the field of technical communication. Minimalism is a design style that originated in visual arts and music. This art style was heavily influenced by the Bauhaus art style in the 1960s (Meyer, 2015a; Bayley, n.d.). The world famous architect Ludwig Mies van der Rohe, who was also the last director of Berlin's Bauhaus, once said: "We reject all aesthetic speculation, all doctrine, all formalism" (Bayley, n.d., para. 6). In the 1980s, with the popularity of the World Wide Web, the philosophy of minimalism was adopted by the technicians and researchers of human-computer interaction. John Carroll, in the late 1980s, studied the process of novices learning to use computers. In this study, he found that users want to use the computer immediately instead

of reading the informative manual first (Mackenzie, 2002). Consequently, Carroll proposed nine principles of minimalism in documentation and manual design (Franks & Williams, 1990), including, for example, inviting users to start the real task quickly, exploiting the prior knowledge of users, and supporting error recognition and recovery. In 1995, Jakob Nielsen included minimalist design principles in his ten usability heuristics and advocated eliminating irrelevant information from interfaces (Meyer, 2015a). After 20 years of development, when the Web interface design stepped into the 21st century, it brought with it the principles of minimalism. Google was considered the pioneer of minimalist design (Meyer, 2015a). The home page of Google has had few changes since 1999. The simplicity and limited color palettes have become the identifying feature of Google's interface design.

What exactly, then, is the connection between minimalist design and flat design? According to research by Nielsen Norman Group, a consulting group focused on evidence-based user experience research, many of today's most popular design trends (including flat design) are directly or indirectly influenced by minimalism. The Nielsen Norman Group analyzed 112 minimalist websites recently, discovering that 96% are flat (Meyer, 2015b). However, the Nielsen Norman Group's research also indicates that not every minimalist or flat design lends to good usability. A balanced design style could embrace both flat and skeuomorphic designs. Such a conclusion aligns with Carroll's minimalist theory in technical communication: cutting the elements and reducing redundancy to serve the needs of users.

However, minimalist design is part of a more important concept in technical communication: user-centered design (Mackenzie, 2002). Therefore, it may be more productive to analyze flat design from the perspective of user-centered design. If we look at design from a rhetorical, contextualized perspective, skeuomorphic design and flat design serve different audience groups. Flat design requires designers to think about the essence of function in the interface. Highlighted typography and big and bright color blocks aim at attracting the attention of audiences; on the other hand, abstract and minimal representations may raise the degree of difficulty of audiences' cognitive interpretation. Flat design tends to be favored by younger to middle-aged users because of its simple and contemporary appearance, according a study of 48

participants conducted by William Robbins (2014): "It was found that at 27–45 years of age users tend to strongly prefer a flat design approach to mobile application icons with a strong majority of 65% choosing flat design over skeuomorphic design" (p. 3). Users of this demographic catch on easily with abstract images and typically experience less of a learning curve than older users. Skeuomorphic design, on the other hand, is easy to understand and operate when taken as a whole, so it is more user-friendly to children, elders, and novice users.

A good interface is easy to navigate and yields high affordances so that users can accomplish an intended purpose. The skeuomorphic interface works well on some applications that require operations by users. It results in high resemblance between design objects, such as some earlier versions of the digital calculator and calendar books, and their real-world counterparts. At the same time, however, real-world objects are often wrought with an excessive amount of details and do not lend to easy cognitive interpretation by users, resulting in low readability and poor usability. Thus, skeuomorphic design does not work well with some applications such as temperatures, clocks, and book readers, because these apps require fewer operations and their main function is often to simply deliver information. For instance, the essential purpose of a reader is to enable users to read. A bookshelf design with exquisite details of wood patterns and the animation of turning pages, although vividly real, are unnecessary and essentially useless. Take another example: The purpose of the weather application is to provide users the exact temperatures and forecasts. The mimic image of a thermometer does not necessarily lend to easy readability or help users obtain more accurate temperatures. In fact, reading the scales of a mimic thermometer may raise the difficulty of temperature reading. In these cases, then, skeuomorphic interfaces don't meet the purpose of these applications. It is no surprise, then, that in designing such apps, designers are quick to abandon skeuomorphic design. The redundant textures and other details create a lot of unnecessary noise, which hinders the delivery of the correct information. Undoubtedly, the flat versions of the weather app in Figure 6 and the calculator app in Figure 7 are clearly appealing alternatives to their skeuomorphic counterparts in delivering essential information through simple and clear interfaces.

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Figure 6. The weather app in flat design (Apple iOS 8.3).



Figure 7. The calculator app in flat design (Apple iOS 8.3).

Flat design also owes its quick popularity to the fact that it stands well to the test of the measuring stick of responsive Web design (Müller, 2014). As we have mentioned earlier, fewer image assets will reduce the response time of loading Web pages, and scalable vector graphics can better accommodate different sizes of the screen. In many ways, flat design fits the purpose of responsive Web design. While flat design is clearly the new fad in the digital design world, the question is: Will it replace skeuomorphism? The answer is not an easy yes or no. A good design takes into consideration both the audience and the purpose of applications. Applications and devices with different purposes and audience groups could certainly accommodate different designs. Clearly, skeuomorphism and flat design are not mutually exclusive. Integration of elements from both designs is not an uncommon practice. Take Apple, for example. Its earlier iOS design was heavily skeuomorphic. It switched to a more flat design in its iOS 8. In so doing, however, Apple didn't totally reject skeuomorphism in its new version of iOS but instead combined elements from both. For instance, as shown in Figure 6, the interface of the weather application in iOS 8 is a combination of flat and skeuomorphic design: On the flat end, the temperature is in plain but very readable numbers, whereas on the skeuomorphic end, the animation of forecast is much more real than the one in the previous version.

So far, we have examined flat design in the American context. While it is important to do so, we believe an

analysis of flat design practices in the Chinese context would allow us to explore and possibly determine whether cultural factors are at play behind the flat design approach. We chose the Chinese culture as the contrasting counterpart to the American cultural context because the former is representative of Eastern cultures whereas the latter is a prototype of Western cultures. These two cultures possess different aesthetic, ideological, and rhetorical traditions. An examination of flat design in both cultural contexts would test our assumptions about the second part of our research focus: What cultural factors are at play in driving the flat design trend (or any design trend) in UI design?

Flat Design In The Chinese Context

Interface design in China has evolved more or less along the same lines: While skeuomorphic design once was the norm, the field is clearly witnessing a trend toward flat design. In this section, we'll first examine various designs and their distinct characteristics. We'll then explore what cultural factors could possibly account for this willing acceptance of flat design.

Interface design in China is demonstrating some distinct characteristics. First, the overall trend seems to coincide well with Western developments in the field. For example, there has been a clear trend toward flat design in the evolution of logo designs in the West. Mercedes' logo design lost both the color and the 3-D effect in the course of its evolution, with the current logo clearly a product of the minimalist approach¹. The Pepsi logo, although it has retained color, has shed both the 3-D effect and the fancy text². The Windows logo³, likewise, also shed its 3-D effect during its evolution process, but what's interesting is that the first logo it used in 1985 is very much a flat design, much like the current logo, suggesting that Windows has switched from flat design to skeuomorphic design and then back to flat design again.

Similarly, in China, logos, icons, and general user interfaces are demonstrating an incredibly flat design

¹ For an evolution of Mercedes's logo design, please see <http://www.logodesignlove.com/mercedes-benz-logo-evolution>

² For an evolution of the Pepsi logo design, please see <http://www.logodesignlove.com/pepsi-branding-and-logo>

³ For an evolution of the Windows logo design, please see <https://allisonrokeefe.wordpress.com/2014/02/19/the-evolution-of-brand-name-logos/>

trend. Figure 8 includes samples of typical icon design in China. Although many of the icons have retained the rough shape of the object they represent, the actual visual representation is strictly two-dimensional and abstract. Logo design in China exhibits the same proclivity toward flat design. For example, logos displayed on the portfolio page of a logo design company are all purely flat design⁴. If one company is not representative enough, then a



Figure 8. The flat icon design in Chinese apps.

Google search with the term “Chinese logo design” should be convincing evidence that over 90% of the logos found in the search results are flat (see Figure 9). Logo design in China is increasingly adopting the flat and minimalist approach. Such a trend is also in line with the basic design principle: Less is more.

User interface design in China is also following suit in adopting the flat approach. Figure 10

4 See <http://www.logo-asia.com/logo-design.html>

features the technology company FHZ’s website that is purely flat in design. This design goes very far in its abstract representation without sacrificing readability and usability. It must be noted, though, that the icons on this website interface rely heavily on the text that goes with each icon. Icon and text complement each other. Without either one of the two, their readability and usability would be greatly undermined.



Figure 10. The flat user interface for a technology company’s website.

This doesn’t mean, however, that skeuomorphic design no longer has its place in UI design in China. The website interface for a wedding planning business

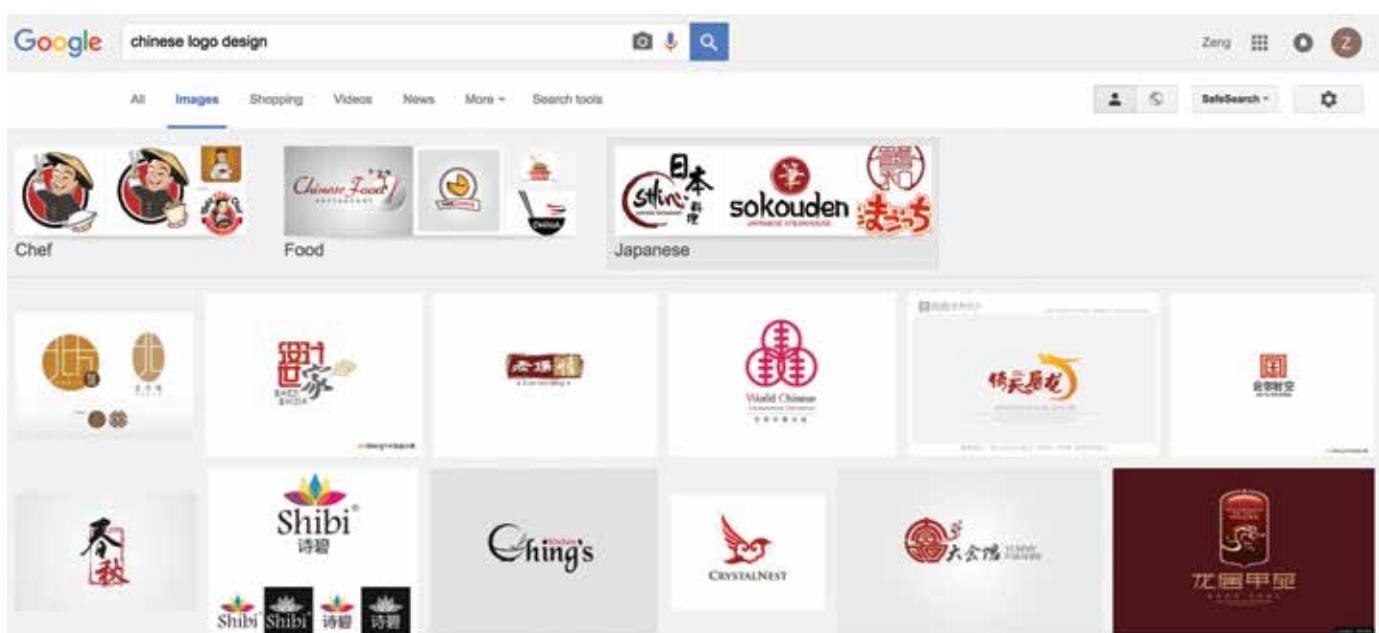


Figure 9. A Google search of “Chinese logo design” turned up over 90% flat design logos.

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in Figure 11 features a design very characteristic of the skeuomorphic approach. As we can see, the design relies heavily on actual photographs of actual people and objects, from the two models to the umbrella, the chair, the lamp, etc. There's very little abstraction in the design. What's more interesting, however, is the integrated design in Figure 12. This design for the Didi Chuxing company, the Chinese version of Uber, features a realistic-looking light and picture frame, both of which are quite skeuomorphic. At the same time, the app icon in the center uses more abstract visual representations typical of flat design and has shed many of the details of an actual automobile. Figure 13 presents a more intriguing case as it combines skeuomorphic and flat designs in a more subtle way. On this website of the National Palace Museum of Taipei, the abstract and conceptualized representation of the Chinese cultural element (flower painting) is undoubtedly reflective of flat design principles, while the 3-D rendition of the vase suggests a skeuomorphic slant.

A second distinct feature of UI (especially logo) design in China is its play on words (Chinese characters), especially those employing the flat design approach. Many Chinese characters, especially in their earliest originating forms, are hieroglyphic, meaning the character is representative of the object it denotes in its form and shape. The design for the logo for



Figure 11. A website for a wedding planner featuring skeuomorphic design.



Figure 12. Interface design for Didi Chuxing, the Chinese version of Uber, featuring an integrated design with both skeuomorphic and flat features.



Figure 13. Website of National Palace Museum of Taipei featuring both skeuomorphic and flat designs.

2008 Beijing Olympics⁵, for example, plays on the hieroglyphic character 京, which is the second character in "Beijing" and which also represents a running person. Figure 14 shows a similar play on Chinese characters. In this figure of the website for Dingcheng Group, a science and technology company in China, the logo on the top left of the webpage features, on the top half, a pictographic combination of the two characters 鼎城 (Dingcheng). This pictographic representation is shaped much like what the character 鼎 denotes: a vessel often with a tripod base. Apart from this denotative meaning, the character 鼎 (ding) often carries the connotative sense of a very stable object due to the tripod support base, thus implying stability for a company. This play on the characters in logo design, we believe, has contributed to the move to the flat approach in UI design in China in that Chinese characters themselves are simple and abstract in nature, however hieroglyphic they might be, and their representations, therefore, are inherently simple and abstract as well.

A third distinctive feature about interface design in China is that it often incorporates elements from the traditional Chinese culture, the so-called Chinese element. But what defines the Chinese element? According to Zhen Tan (2010), the Chinese element is something that's uniquely Chinese, recognized by most Chinese, something that represents what China is, and something that allows others to know and understand China (p. 2). A Chinese element could mean a number of different things: Chinese calligraphy,

⁵ The 2008 Beijing Olympics logo can be found by a Google image search with the term "2008 Beijing Olympics logo."



Figure 14. Logo on top left of this website for Dingcheng Group plays on the Chinese character ding in its design.

Chinese seal carvings, Terracotta warriors, a Chinese knot, Qin bricks and tiles, Peking opera face masks, Chinese lacquer, red lanterns, dancing lions, oracle bone inscriptions, books with a vertical layout, a Chinese teapot, Chinese porcelain, or Chinese painting. The list is endless. Incorporating such elements into UI design makes things a little intriguing because many of these traditional Chinese culture elements tend to be detail heavy and may often push the design toward the skeuomorphic. A flat design that incorporates such traditional elements, then, poses a special challenge for the designer.

For example, Figure 15, the website for the exchange platform for studying ancient Chinese literature contains several distinctive traditional Chinese cultural elements: the ancient book, the traditional architecture, the boat, the bamboo, and the overall frame that looks like the frame for traditional Chinese painting or calligraphy. The entire interface is designed to resemble a traditional Chinese painting. While there's a high resemblance between the intended objects and their representation in the interface, details have been simplified and streamlined to avoid cluttering the page. The main

element—the book—is accented to highlight the theme of the website: Online Exchange Platform for Studying Ancient Chinese Literature, while the other Chinese elements are more or less simplified and de-emphasized so as not to be too overwhelming. Such a treatment renders the design a combination of flat and skeuomorphic designs with the latter slightly more dominant than the former.

The blue and white porcelain design background in Figure 16, on the other hand, does a better job at integrating the Chinese element—the blue and white porcelain—into its flat design. This is a Web design template offered by a Web design company. While details from traditional blue and white porcelain are often very elaborate, the designers in this case only incorporated some key elements and presented them in a more abstract fashion. The overall design, therefore, manages to avoid being skeuomorphic despite the slight cluttering of the page with a few too many elements.

Overall, incorporating elements from the traditional Chinese culture into UI design is a rather common practice in China. Since traditional Chinese cultural elements tend to be wrought with details and lend more

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Figure 15. Online platform for studying ancient Chinese literature incorporating uniquely Chinese elements: an ancient Chinese book, an ancient Chinese house, and an old-style boat.

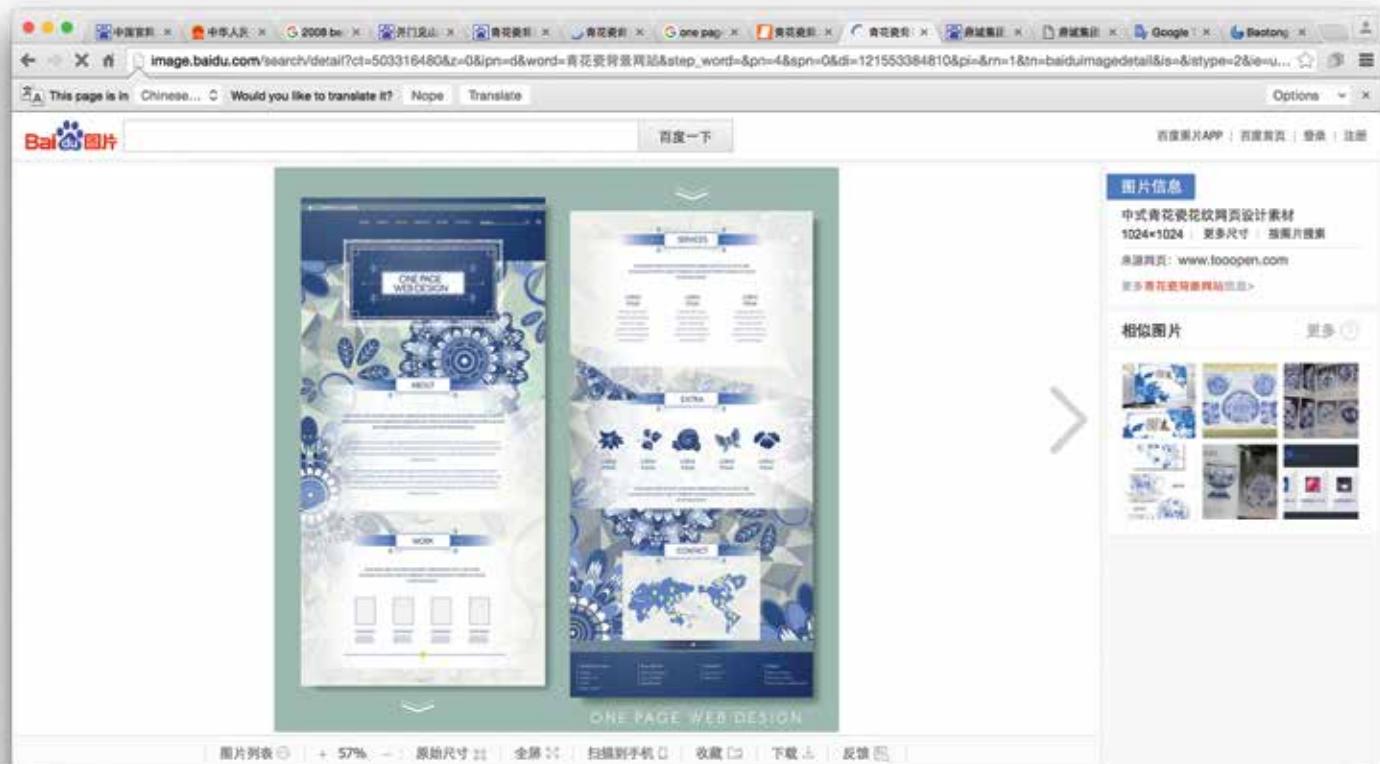


Figure 16. Blue and white porcelain as the unique Chinese element in this interface design.

naturally to skeuomorphic design, they pose a special challenge to those who favor the flat design. However, as we have shown in our discussion above, flat design that incorporates such elements can nevertheless be effective if the design is carefully thought out.

So far in this section, we have shown that while skeuomorphic design still has its place, there's a strong tendency to move toward flat design in UI design in China. This move toward flat design, although coinciding with the development in Western UI design, is more than just a blind following of the Western trend. We hope our discussion has demonstrated the intricate connections between this design approach and Chinese cultural elements.

Rhetoricing The Chinese Context: Why the Flat Design?

Flat design is clearly making its waves in the Chinese UI design field, although skeuomorphic design still has its rightful place. What has accounted for the popularity of flat design in China is, in some respects, also a uniquely Chinese phenomenon. While numerous factors could be attributed to the rise and popularity of flat design in China, we attempt to approach our analysis from the following four aspects: ideological (philosophy), cultural (painting), linguistic (character formation), and social (status). However, we should preface our analysis with the disclaimer that pinpointing the exact reasons behind the popularity of flat design in China is downright impossible, much like pinpointing the exact logical relationships between cultural thought patterns and rhetorical styles, between rhetorical styles and philosophies. Such relationships are developed over centuries and are intertwined in more ways than one. Nevertheless, this should not stop us from making observations, however over-generalized, about what may have accounted for the popularity of this new trend.

First, as Selfe and Selfe (1994) have pointed out, user interfaces are social spaces where “cultures meet, clash, and grapple” (p. 482). We can therefore look to Chinese ideologies for some possible underpinnings for flat design. Chinese philosophical ideology has always been one of polar opposites. For example, while it may champion extravagance (e.g., in lifestyle, in speech, in writing) on the one hand, which could account for the skeuomorphic approach, it also advocates simplicity on the other. Taoism, one of the most influential traditional

Chinese philosophies, has always advocated the principle of simplicity as the eloquent Lao Zi, for example, has claimed: “Too many colors blind one's eyes, and too many sounds deafen one's ears” (translation ours). Lao Zi's famous saying—“Less begets and more deflects”—is very similar to the Western architect Mies van der Rohe's famous adage “Less is more.” This championing of simplicity was shared by Confucius, who argued: “Red paint should not be further ornamented, white jade should not be carved, and precious jewel should not be decorated. Why? Because abundance in quality defies decoration.” This emphasis on simplicity translates into simplicity in all aspects of life: simplicity in lifestyle (frugality), simplicity in speech (conciseness and respect for others because “silence is golden”), simplicity in writing, etc. The design field is certainly no exception.

Second, Chinese painting, in a similar fashion, endorses simplicity, which is best represented in its use of symbolism and abstraction. Two kinds of traditional Chinese painting—Chinese gongbi and Chinese landscape—both advocate simplicity. Chinese gongbi painting (see Figure 17), a kind of painting that pays meticulous attention to details, focuses on painting two-dimensional human figures. Although this kind of painting pays close attention to details, its representation of human figures is rather abstract and, often times, does



Figure 17. Chinese Gongbi painting as a unique Chinese element is often featured in interface design.

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Figure 18. Chinese landscape painting as another unique Chinese element is also featured frequently in interface design.

not concern itself with how accurate the representations are. In a similar way, although with very different forms of representation, the Chinese landscape painting also emphasizes simplicity and abstraction. As shown in Figure 18, landscapes in these paintings are often two-dimensional and abstract, with simple strokes to depict nature in its pure, simple form. Painting has probably exerted the largest influence on designers, as many designers in China started their training in design by learning painting. It's natural, then, that styles in Chinese painting will inevitably influence styles in design.

Third, we believe the unique nature of the Chinese language itself has had some subtle influences on flat design. Chinese character formation has evolved from the more realistic hieroglyphic imagery in the early days to the later, more abstract ideographic representation. Figure 19 shows the evolution of the character *jia* (home). The earlier, more hieroglyphic forms of the character on the left very much resemble a house, with a roof on the top, walls on the sides, and animals/pigs (representing food and wealth) inside. The more recent and ideographic forms on the right are apparently more abstract. Today, most hieroglyphic characters have evolved toward the more ideographic form, a trend toward simplicity and abstraction, two important qualities of flat design.

A fourth factor that has contributed to the popularity of flat design in China, in our opinion, is



Figure 19. Evolution of the Chinese character *jia* (home) from the early, more hieroglyphic representations on the left to the late, more ideographic forms on the right.

social and economic status that's often associated with American and European products and fads. Since the 1980s, China has witnessed a steady trend of idolization of Western culture, in spite of constant challenges from Chinese nationalism. This idolization is so significant that adopting anything Western in many fields is often seen as a sign of economic and social status. This is also the main reason why developments in the design field in China have largely coincided with those in the US. It must be noted, though, that many Chinese designers have done more than merely copy the American style but instead have actively sought ways to incorporate Chinese elements into their design to make their design integral in the Chinese context.

How exactly culture shapes our UI design approaches may not be immediately clear, given the limited scope of our study. However, as our analysis has demonstrated, there's no question it plays a significant role in our perceptions of interfaces and in how we approach UI design. The connections between UI design and cultural elements and traditions are more than mere coincidences. User interface design is by no means a random, merely technical act; it is deliberate design with rich cultural underpinnings. What constitutes logical or intuitive is often not universal but contextual. Understanding the underlying philosophy behind users' perceptions means more effective, culturally informed UI design.

Conclusion

Some design styles come and go; others become perpetual. User interface design in both China and the US has experienced skeuomorphic and flat designs, shifts between the two styles, competition between the two, as well as integration of the two. Skeuomorphic design obviously had its heyday, and flat design is making the wave. However, it's safe to assume that neither is going away any time soon and neither will be the sole design style to the exclusion of the other. More likely than not, the two styles will co-exist, and the most effective design may well incorporate elements from both styles.

Based on our analysis and discussions, we recommend the following:

- *Understand the context.* Any interface is accessed in specific contexts. Therefore, it's imperative to understand your audience, your purpose, your constraints, the culture, etc., before you start any design. Specifically, this means understanding such factors as the demographics of your users (e.g., age group, sex, education level, expertise, cultural background, ideology, etc.), use environment (e.g., home vs. workplace), access platform (e.g., desktop, laptop, pad, smart phone), purpose of use (e.g., browsing for information, interactive transactions), etc.
- *Embrace both (in fact, all) styles.* Skeuomorphism and flat design are not mutually exclusive. Skeuomorphism is useful to the extent that the design resembles the physical object in function as well as form. Flat design is useful to the extent that the simplicity of the design does not interfere with the cognitive understanding by the user. This translates in design practice into incorporating elements from both styles that are conducive to human cognition and conceptual perception of the implied association between form and function. For example, skeuomorphism's attention to details can be integrated with flat design's more abstract representation to create icons that could easily help users identify their functions. This can be done without being overly burdened with minute details that interfere with users' understanding or overly abstract renderings that hinder users' perceptions.
- *Use flat design and abstraction with moderation and good intuitive sense.* Just because it's a new trend doesn't mean it's all positive. With flat design, there's a greater risk than with skeuomorphism to overdo it and end up with a design that leaves the reader utterly confused. Abstraction can be done up to a point where it helps, not hinders, readers' cognition. Observe the following rules of thumb when creating abstract renderings of a particular object: (a) identify the particular features that uniquely define an object because these identify the object easily; (b) incorporate these features into the design—these features are what define the object and what help the user identify it; and (c) do a simple test: If a user can't recognize at first glance what the design denotes, it should probably be reconsidered.

- *Globalize your design.* What we mean by this is that an effective design should incorporate universal elements so that it can be understood by people from different cultures. Such universal elements may include commonly recognized graphics, symbols, or even text, but more importantly, the design should allow culturally universal affordances so that it can be localized within any particular geopolitical context. Several measures could be taken to ensure a more globalized design: (a) bring a localization expert (someone with expertise about the target culture and target user group) into your design team at the very early stages of your design process; (b) use more universal, non-culture-specific graphics, icons, and symbols; and (c) use non-idiomatic language (even with English, more simple, standard English is easier to understand or translate).
- *Design your interface with localization in mind.* A good design should be able to be localized to its particular cultural context. Any design is ultimately a cultural phenomenon. The effective incorporation of cultural elements is key to successful design. As Ping Wang (2014) has argued, different cultures beget different designs, and a Chinese design should be a good representation of the Chinese culture. Designs with localization capabilities will allow cultural affordances to enable contextualized user interfaces. Again, observe a few simple guidelines: (a) avoid a design-first-location-second type of process; as mentioned above, localization experts should be brought on the design team from the very beginning because mistakes committed at the design stage would be hard to be undone later in the localization process; (b) design with options for modification and adjustment; for example, a fixed-width textbox that might be just right for English may turn out to be too big for Chinese but too small for Arabic; and (c) design your interface with flexibility in such a way so that elements on the interface could easily be replaced with elements more appropriate for the target culture.
- *Put usability first.* Whatever design approach you adopt, don't lose sight of the big picture: The overriding objective of UI design should always be usability. User interface designers should aim for ease of understanding and the simplification of execution for the user. Therefore, always conduct usability tests with your target users before putting the product

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to use. This means using the actual target users, creating genuine test environments that mimic the real-life use situation, and designing tasks that are representative of the typical tasks your target users will perform with your product or interface.

As much as we would like to be specific about these guidelines, we also understand that in actual design practice, it comes down to a designer's accurate assessment of the user context, evaluation and selection of design options, and overall execution of different design principles informed by cultural awareness.

Skeuomorphism or flat design, what will prevail as THE style is not the issue. A good professional sense plus an acute cultural perspective on what works and what doesn't is more helpful. What is ultimately more important, though, is for both practitioners and researchers to join the conversation about building a common ground that would allow diverse cultural perspectives on effective UI design.

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Manuscript received 1 May 2015, revised 21 March 2016; accepted 12 May 2016.

Technical Communication as User Experience in a Broadening Industry Landscape

By Claire Lauer and Eva Brumberger, Arizona State University

Abstract

Purpose: Based on an analysis of 502 industry job postings, this article argues that technical communication work shares traits and competencies with the field of UX and that technical communicators who are not already doing UX work are well-qualified to expand their career paths into the UX field and could, in fact, play a central role in UX.

Method: We analyzed 502 user experience job postings from Monster.com. After mining the postings for position title, job type, education level, experience level, location, salary, and industry sector, we conducted a content analysis of the job descriptions, using open coding to identify professional competencies and personal characteristics that employers are seeking in applicants, as well as key technologies and information products.

Results: The user experience job postings could be grouped into five categories—Designer, Developer, Architect, Manager, Researcher—each with a distinct profile in terms of information products, technology skills, and professional competencies. However, the job postings also reflected skills, competencies, and characteristics that were common across job categories, and several of these are areas that overlap with more traditional technical communication positions.

Conclusion: We articulate the advantages and challenges of transitioning into UX and make recommendations to help technical communication practitioners and programs capitalize on the advantages and address the challenges.

Keywords: user experience, jobs, competencies, technologies, usability

Practitioner's Takeaway:

- Provides empirical support for user experience as an extension of technical communication.
- Highlights areas in which technical communicators are ideally positioned for jobs in user experience.
- Provides workplace data for practitioners and those in academia who are engaged with ongoing efforts to keep curricula current and relevant.

Introduction

Developing information products—e.g., instructional documents—for specific users has long been the core of technical communication work. Investigating how users interact with information products, and using that understanding to improve the design of those products, is also central. Professionals in technical communication and related fields have largely referred to assessing the effectiveness of an information product as “usability.” However, several scholars (see, for example, Johnson, Salvo, & Zoetewey, 2007; Redish, 2011; Potts, 2014; Sullivan, 2014) have argued for the need to move beyond usability to the richer and more inclusive approach of user experience (UX). Based on an analysis of 502 industry job postings, this article argues that technical communication work shares traits and competencies with the field of UX, and that technical communicators who are not already doing UX work are well-qualified to expand their career paths into the UX field and could, in fact, play a central role.

Usability and User Experience

Usability focuses on evaluating how well a user can navigate through a variety of tasks that an end product was designed to facilitate. Jakob Nielsen (2012) suggests that usability is comprised of five distinct components, including learnability, efficiency, memorability, errors, and satisfaction. Traditional approaches to usability focus on examining how well a user completes a series of isolated tasks while interacting with a single information product. However, as Dicks (2011) points out, “As the product gets larger and more complex, usability-testing methods prove increasingly inadequate for testing usefulness” (p. 208). Usability data collected in isolation often mask the complexity of the system (or multiple systems) and the complexity of a user’s interactions with that system in a real environment (Mirel, 2003; Still, 2011), thus hiding what Alber (2011) describes as “the turmoil beneath” (p. 3). Golightly et al. (2011) argue that usability needs to attend to both social and organizational complexity as well as technical complexity, “which moves away from a traditional input-output view of interaction to consider the use of multiple modalities, tasks, and interfaces during a single interaction with a system” (p. 282).

The broader concept of user experience (UX) also attempts to accommodate the complex realities of a

user’s interactions, and integrate design and functionality across the entirety of a user’s brand experience.

Nielsen (*Definition of user experience*) suggests that UX “encompasses all aspects of the end-user’s interaction with the company, its services, and its products.” In this way, UX suggests designing for interconnectedness, where tasks and texts no longer exist individually or in a silo, but instead connect across a broad and complex landscape of interfaces and environments. Ideally, UX also strives to accommodate how users appropriate information products and content in unanticipated ways and for their own purposes as well as how those products position users to act in the world by the way they are designed and the options they allow for. Thus, rather than the focus being solely on how quickly or accurately a user is able to complete a certain task, UX design and architecture attempt to build a more holistic and fluid experience, including one that acknowledges the multiple platforms, interfaces, and spaces by which a user may interact with a brand or information product. This holistic approach to the user is captured in the interdisciplinarity of UX, which, as a field, combines communication, psychology, human-computer interaction (HCI), social science, design, technology, and other specialized knowledge areas in an attempt to better understand user practices and meet the needs of users within and across information products and interfaces.

UX is typically implemented as a multi-stage process. The precise order and naming of the stages varies somewhat, as evidenced by the dozens of process illustrations found in UX handbooks and posted by UX professionals to the Web. For the most part, however, the process follows the pattern illustrated in Figure 1, which identifies five recursive stages, each with various sub-tasks and products.

Closer examination of Figure 1 reveals tasks and products in every stage of the UX process—such as personas, sitemaps, wireframes, styles, markup, and user feedback—that are already familiar to technical communication. More importantly, an overarching emphasis on the user makes technical communicators as valuable as programmers, psychologists, graphic designers, and others who are typically recognized as contributing to the UX process. In this respect, UX is a natural extension of the work that technical communicators already do, especially in the modern technological context of responsive design, in which content is deployed across a wide range of interfaces and environments. In fact, in an

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UX Design Process

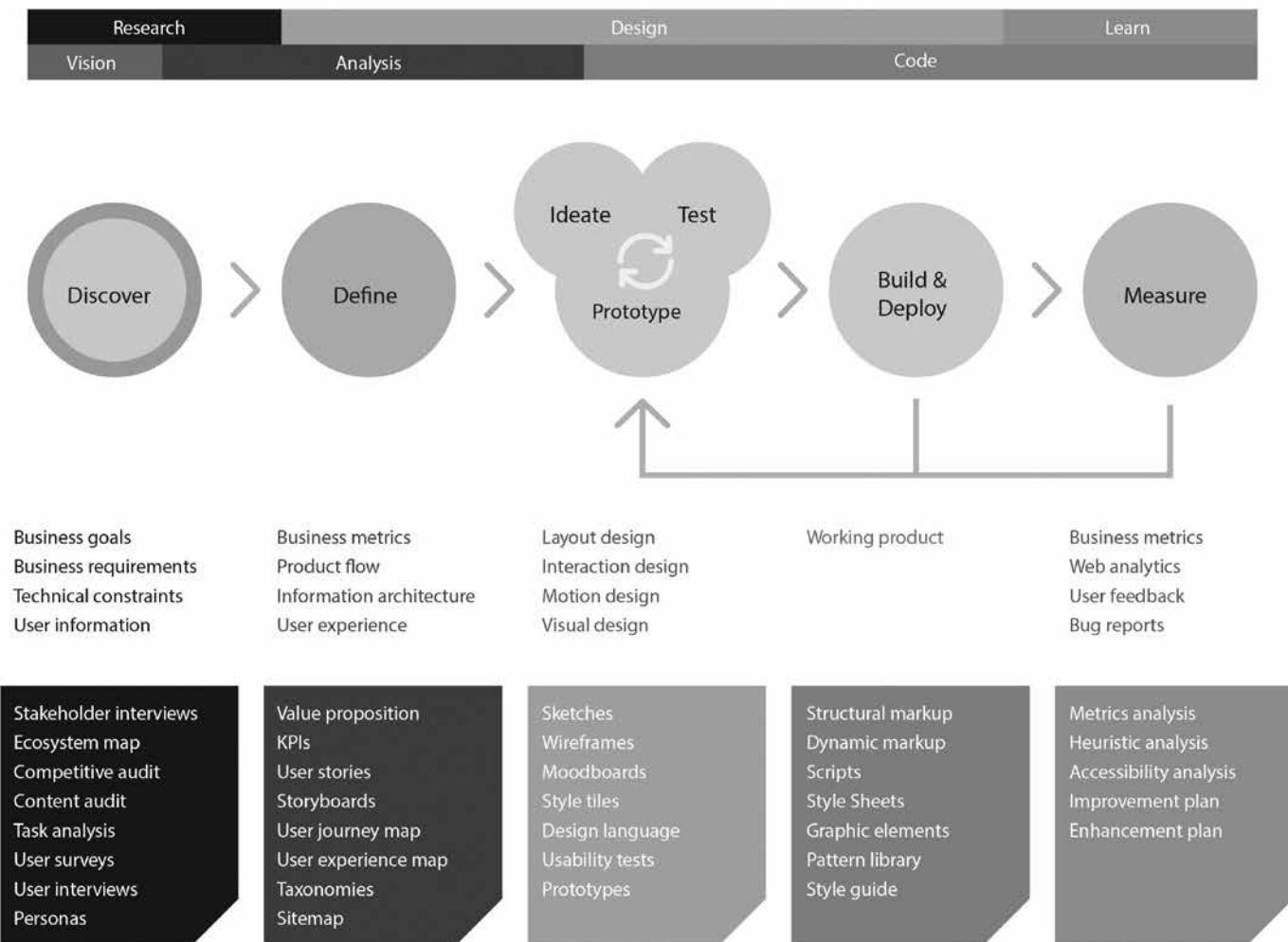


Figure 1. UX design process (Kobar, 2014)

effort to show the closeness of the relationship between technical communication and UX, Redish and Barnum (2011) list several well-known UX professionals, (e.g., T. Adlin, D. Chisnell, J. Hackos, T. Howard, and others), who started out as technical communicators (p. 91). Despite the natural overlap, UX job advertisements seldom request that applicants have an educational background in technical communication, leading Redish and Barnum to argue that technical communicators must do more to “claim a seat at the UX table” (p. 95).

Claiming a seat may not be as difficult as one might think. Redish and Barnum (2011) point out areas of shared expertise between technical communication and UX, along with goals that are “similar and compatible” (p. 95). Additionally, the interdisciplinarity of UX

allows for more entry points. Farrell and Nielsen’s (2013) survey of 963 UX professionals revealed that there was “no single defining characteristic of user experience careers” (p. 6). No one type of bachelor’s degree dominated; instead, respondents had a broad range of disciplinary backgrounds. When respondents listed the courses they had taken that were most helpful for a UX career, the list included courses a technical communication student might take: “presentation skills/public speaking, project management, graphic design, composition and layout, technical writing, typography, and persuasion and persuasive writing” (p. 52–53). Likewise, the summary of general UX skills and tasks reported by Farrell and Nielsen would look very familiar to a technical communicator. These include:

- Find and solve new problems in the evolving relationships between people and machines.
- Advocate for the humans in human-computer interaction.
- Plan customer experiences throughout the product and service lifecycle.
- Conduct research, design, and fix products and services to make them easier to use (p. 19).

In light of these overlaps, technical communicators should feel confident in their qualifications for UX jobs, regardless of whether those jobs request degrees or work experience in specializations other than technical communication.

This article provides empirical evidence in support of the argument that technical communicators are well qualified to move into UX or claim a more central seat at the UX table. We examined 502 UX job advertisements in an effort to map the UX landscape and identify intersections between technical communication and user experience. Our research highlights the education, experience, technology skills, professional competencies, and personal characteristics sought by UX employers; it also emphasizes characteristics and competencies that are shared between UX and technical communication. The data can help us better understand the anatomy of UX and, in turn, articulate the value added by technical communicators to the UX process.

Methods

Job advertisements are crafted with the specific goal of attracting candidates who best fit the employer's needs. As such, the advertisements typically outline employer expectations, job responsibilities, required skills, preferred qualifications, and so on. Some degree of uncertainty is unavoidable regarding how closely the job description actually matches the day-to-day work of the person hired, but it is in the employer's best interest to be as accurate, specific, and detailed as possible. Thus, an analysis of job advertisements can reveal patterns that provide insight into the core competencies that characterize the field.

We used industry job postings from Monster.com for our study, because it returned the highest number of technical communication jobs during our initial searches. We restricted our search to a single job site to avoid duplication of postings. For search terms, we

used an extensive list of potential job titles constructed from previous research (Blythe, Lauer, & Curran, 2014), the STC job board, and an STC session preceding the 2013 Council for Programs in Scientific and Technical Communication (CPTSC) conference (see Table 1).

Table 1. Job titles (search terms)

Content Administrator	Social Media Specialist
Content Analyst	Social Media Writer
Content Architect	Technical Editor
Content Coordinator	Technical Writer
Content Designer	UI Designer
Content Developer	UI Developer
Content Editor	UX Analyst
Content Manager	UX Architect
Content Producer	UX Consultant
Content Specialist	UX Designer
Content Strategist	UX Developer
Content Writer	UX Manager
Documentation Consultant	UX Researcher
Documentation Specialist	UX Specialist
Front End Designer	Web Content Administrator
Front End Developer	Web Content Analyst
Grant Writer	Web Content Architect
Information Architect	Web Content Coordinator
Information Designer	Web Content Designer
Information Developer	Web Content Developer
Medical Writer	Web Content Editor
Professional Writer	Web Content Manager
Proposal Writer	Web Content Producer
Publication Specialist	Web Content Specialist
Social Media Consultant	Web Content Strategist
Social Media Coordinator	Web Content Writer
Social Media Developer	Web Writer
Social Media Manager	

We collected two months' worth of U.S. job postings; data collection took place from September to November of 2013, during which time we collected over 3,000 job postings. From this data, we culled duplicate postings, postings that provided no position description, and postings that were not within technical communication. We then looked more closely at the position descriptions and eliminated positions that were entirely tools-focused. That is, if a job description discussed exclusively technical work (back-end coding, executing pre-existing designs, etc.), to the exclusion of rhetorical work, we discarded it. The culling process

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left us with approximately 1,500 job postings that we separated into two groups: information development (ID: 914 jobs) and user experience (UX: 502 jobs). Here, we provide an analysis of the UX data and discuss overlaps and divergences between the ID and UX jobs.

Data analysis

After mining the job postings for position title, job type, education level, experience level, location, salary, and industry sector, we recorded the tools and technologies called for by each posting. We then conducted a content analysis (see Huckin, 2004) of the job descriptions to examine the competencies and personal characteristics expected of applicants, as well as the information products (documents, applications, etc.) they would be producing. We use the term *competencies* to refer to concrete practical skills (Henschel & Meloncon, 2014), such as written communication or project management. We use the term *personal characteristics* for less tangible abilities such as creativity, leadership, and flexibility—more abstract qualities that may be inherent as well as learned.

We developed a list of competencies and characteristics based on previous research findings (Rainey, Turner, & Dayton, 2005; Lanier, 2009; Blythe, Lauer, & Curran, 2014) as well as our own knowledge of the field. We also relied on an open coding process (see Holton, 2007) in which we examined several postings in order to identify, group, and label key concepts. To ensure consistency in coding, each of the authors independently coded 10 jobs; we then calculated the inter-rater reliability, which revealed that we had 96% agreement in our coding. The Kappa coefficient, which adjusts for chance agreement, was .90, where .81–1.0 is considered almost perfect agreement.

Results

We begin by reporting the position demographics of the job ads followed by a discussion of the job categories, information products, tools and technologies, professional competencies, and personal characteristics called for in the position postings.

Position demographics

Over three-quarters (78%) of the UX jobs were full-time permanent positions, and the postings suggest that these positions are typically not entry level (see

Figure 2), a finding that aligns with the survey data collected by Farrell and Nielsen (2013). Roughly one-third (34%) of the jobs required a minimum of 2–3 years of experience while another 28% required at least five years of experience. Additionally, many of the postings (19%) did not mention the years of experience required or stated explicitly that the experience level was open.

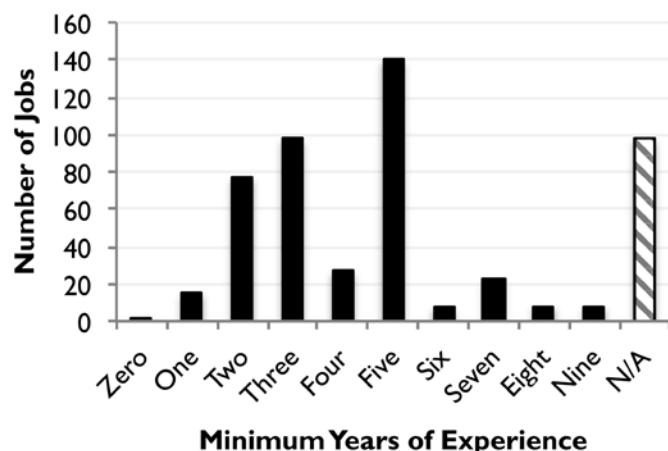


Figure 2. Experience levels

As the map in Figure 3 illustrates, the positions were concentrated on the East and West Coasts. Almost one-third (30%) of the jobs were in the Pacific census region, while the Mid-Atlantic and South Atlantic regions each had 17%. By far, the greatest number of jobs was in California (24%) followed by New York (10%).

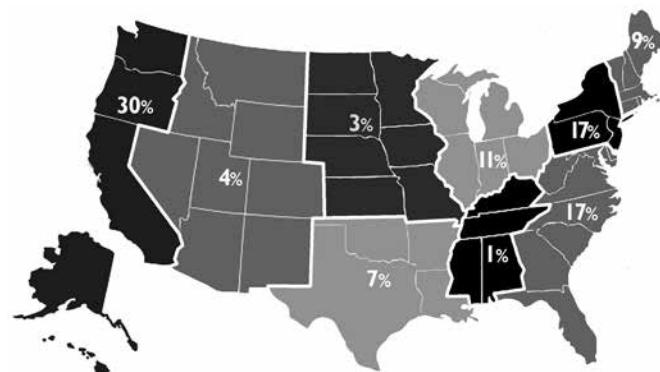


Figure 3. Job locations

Similarly, rather than being distributed across a range of industry sectors, the UX positions were very heavily concentrated within the Information Technology Services/Software (IT) sector (39%), although the

industry sector could not be identified in 14% of the postings (see Figure 4). The concentration of positions within IT supports the survey results reported by Farrell and Nielsen (2013).

Job categories

Closer examination of the position titles enabled us to sort the job postings into five distinct categories: Designer, Developer, Architect, Manager, and Researcher (see Figure 5). These category divisions were based on the actual terms used in the titles (e.g., all positions categorized as Manager had “manager” in the title, all architect positions had “architect” in the title, etc.). The categories of Manager and Researcher had far fewer jobs, so the results for those categories may be less reliable.

Although the job titles suggested there were several different types of designer jobs, including user experience (UX) designer, user interface (UI) designer, and interaction designer, we grouped these into a single Designer category, because closer examination of the actual job descriptions revealed no discernable differences between, for example, a job that asked for a

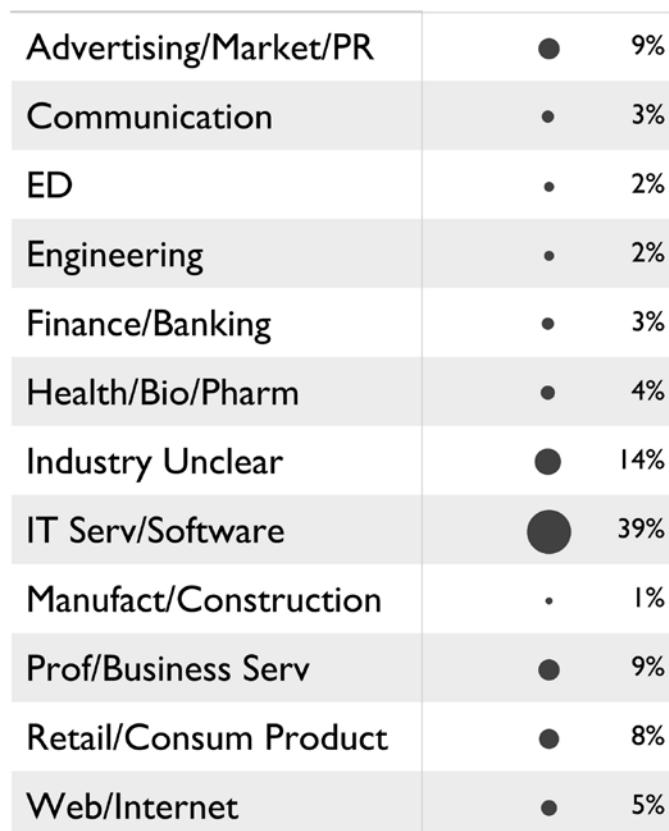


Figure 4. Industry distribution

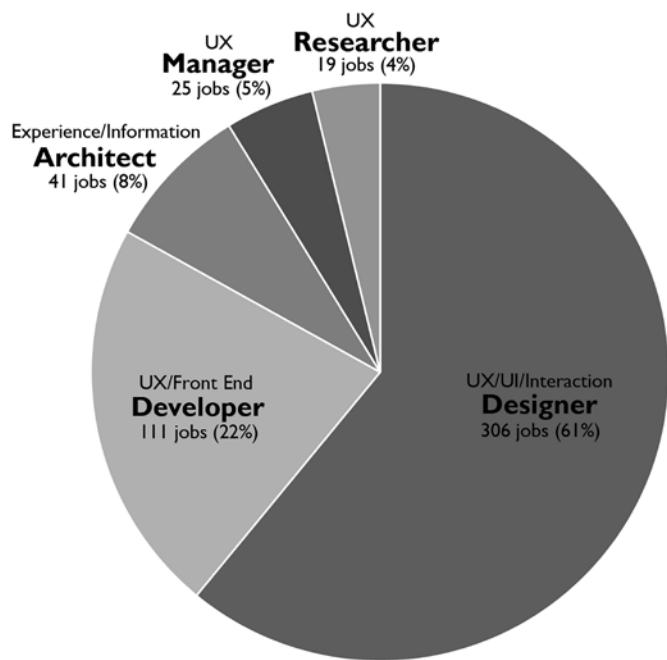


Figure 5. Job categories

UX designer versus a UI designer versus an Interaction designer. Designer jobs, regardless of prefix, are primarily responsible for interface design and layout. However, *designer* appears to be the default job title when employers are looking for generalists who will be responsible for any and all stages of the UX process, from researching requirements, to developing personas, wireframes, and prototypes, to designing the interface, to building and testing the site or application. As a result, Designer jobs account for 61% of the positions.

In contrast with Designers, UX/Front End Developers (22%) are responsible primarily for the actual coding and construction of the interface or application. Developer positions comprised 22% of the job postings. However, it is important to note that the market for Developers is much more robust than our data suggest, because this is the category in which we culled the most jobs due to those jobs including no rhetorical work. For instance, many Developer jobs would describe the primary responsibilities of the Developer to be someone who would flawlessly code a website that had been architected and designed by another person or group within the development process. If coding and debugging were the primary responsibilities of the position at the expense of participating in the actual design process, we culled those jobs. Those Developer jobs we included in our data typically requested that the developer be able to

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code the site or application and that the developer would have some input into the design or structure of the site or application as well.

Experience/information architects (8%) are distinct from designers and developers in that their focus is on crafting the structure of the experience. That is, Architects determine how best to structure information, images, and other material to meet the user's needs and ensure an effective experience.

UX Managers (5%) are leadership positions that typically require a person to oversee team members and the UX process as a whole; these are much more than just experienced UX professionals. Managers are also asked to develop strategy, manage projects, and interact with relevant stakeholders.

Finally, UX researchers (4%) focus almost exclusively on conducting and reporting the research needed to support the work of the other categories. That is, rather than creating the user experience, Researchers supply the critical groundwork for determining what that experience should be, and then they test the experience as it is being developed.

Two other factors set the job types apart from one another: education level and salary. Manager and Researcher positions were far less likely than the other categories to leave education level open; they were much more likely to ask for a master's degree (see Figure 6)¹.

¹ We order the categories by the number of jobs they represent, from greatest to fewest. Because Designer had by far the largest number of jobs, we sorted the rows by the Designer column.

Although only 27% of the job postings included salary information, the salary information that was available again pointed to distinct categories of jobs. Postings for Designer, Developer, and Researcher positions were substantially less likely to include salary information than were postings for the other categories. Additionally, 100% of the Manager and Researcher positions for which pay information was included were salaried, while the other categories all included some hourly positions. In fact, over one-third (36%) of the Architect positions were hourly. In addition to differences across categories regarding how positions paid, there were some differences in how much they paid. As Figure 7 illustrates, the annual salary ranges for Designers and Developers were comparable. However, Architects and Researchers tended to have slightly higher minimums, and the high end of the salary range for Researchers was substantially more than the maximum of Designers, Developers, or Architects. One would expect Managers to be paid somewhat more, but, in fact, there was a striking difference between the Manager positions and those in the other four categories; the low end of the Manager salary range was just above the high end for Researchers. This may point to a shortage of experienced managers who can fill these positions due to the relative newness of UX as a field.

Grouping the jobs into categories enabled us to conduct more detailed analyses of the information products, tools and technologies, professional competencies, and personal characteristics required in

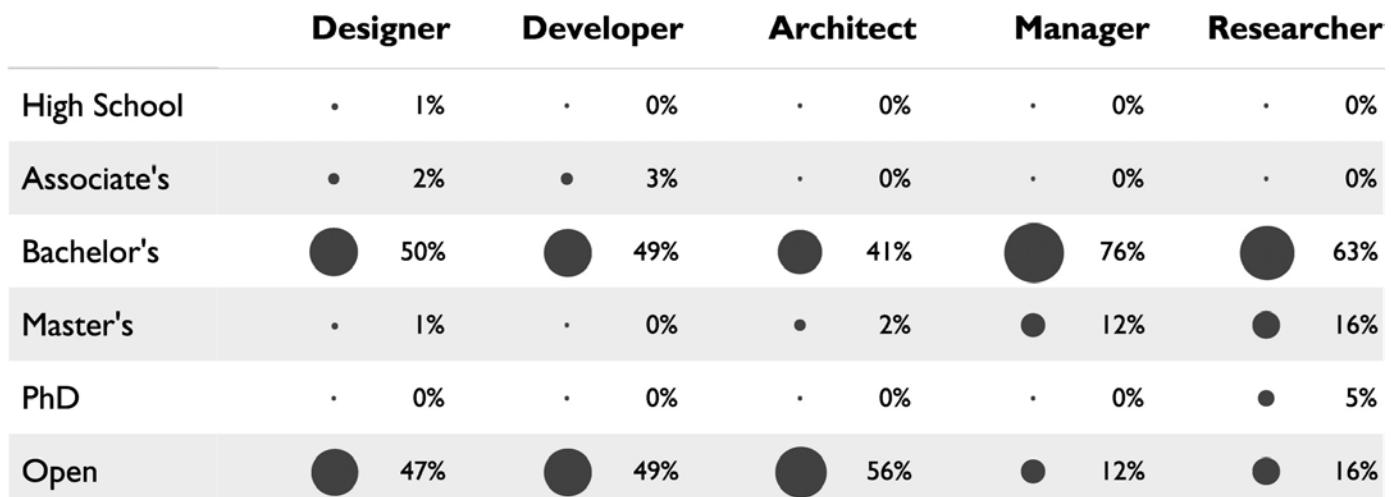


Figure 6. Education by job category

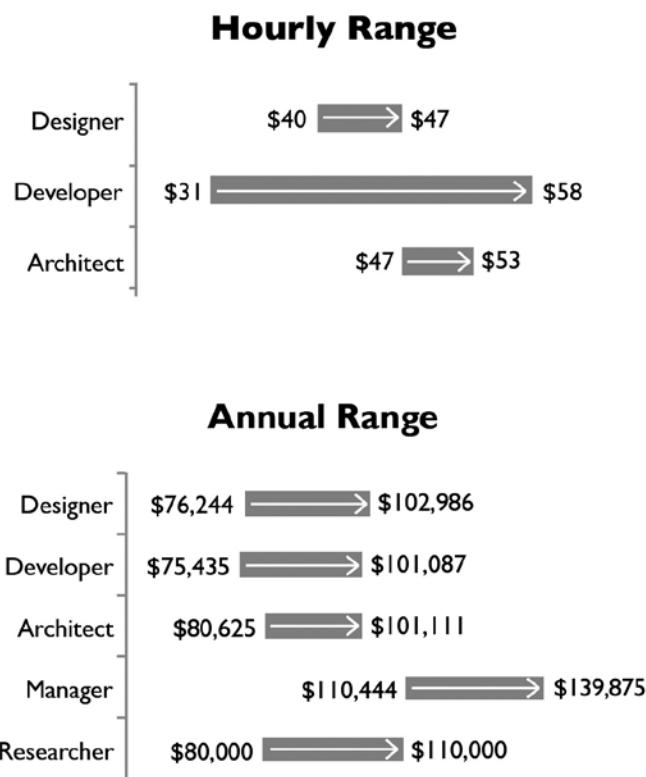


Figure 7. Salary by job category

each type of position. We discuss the results of these analyses in the sections that follow.

Information products

Information products are the deliverables that applicants will produce as part of their job. As Figure 8 illustrates², the majority of the information products for UX positions tend to be intermediary products that support the development of a final deliverable (e.g. a website). So, for example, wireframes, prototypes, and specifications/technical documentation were central to all job categories.

The Architect positions placed the most emphasis on these products, and Architects also produce a greater percentage of user profiles/personas and presentations.

Developer positions placed less emphasis on intermediary products than the other four categories. Prototypes, wireframes, and specifications/technical documents were still important, but Developer jobs focused much more heavily on producing the final deliverables of websites and applications.

² Figures 8–10 list products, technologies/tools, competencies, and personal characteristics, respectively, that appeared in at least 20% of the job postings for any one of the categories.

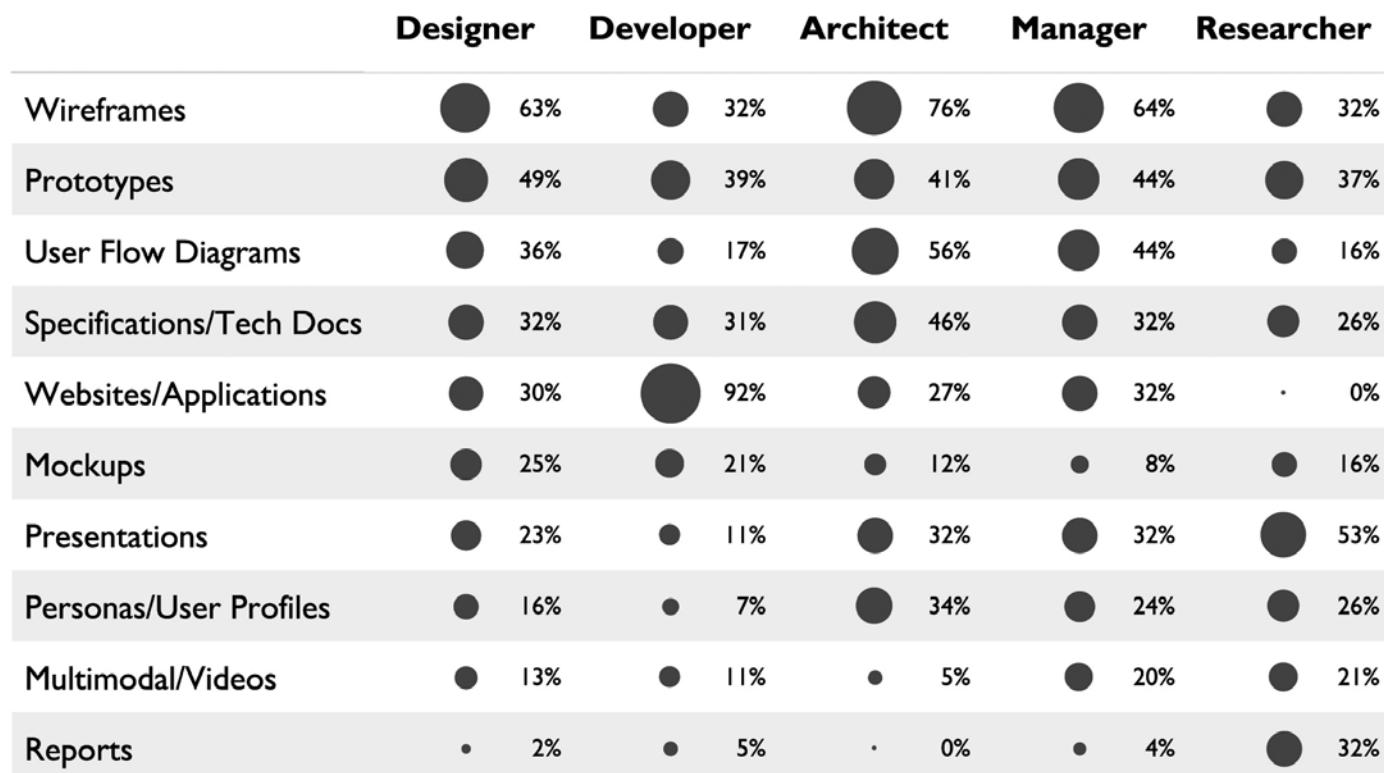


Figure 8. Information products by job category

Technical Communication as User Experience

Researcher jobs included the greatest variety of products, generally because they were tasked with testing the whole range of UX products and using their findings to improve the design of those products (e.g., wireframes, prototypes, interfaces). Researchers were also tasked, along with Architects and, to a lesser extent, Managers, with developing personas and delivering presentations. The most common products requested of Researchers included presentations and reports, which speak to the importance of effectively communicating the results of their research to others on the UX team.

Managers are tasked with overseeing the entirety of the UX process, so they have some responsibility over almost all products listed.

Tools and technologies

As Figure 9 illustrates, UX professionals rely on an array of tools and technologies to craft their information products, although the emphasis on technology does vary across job categories.³

3 Because Adobe CS includes several software programs, when job advertisements called for proficiency in Adobe CS, we also coded for the

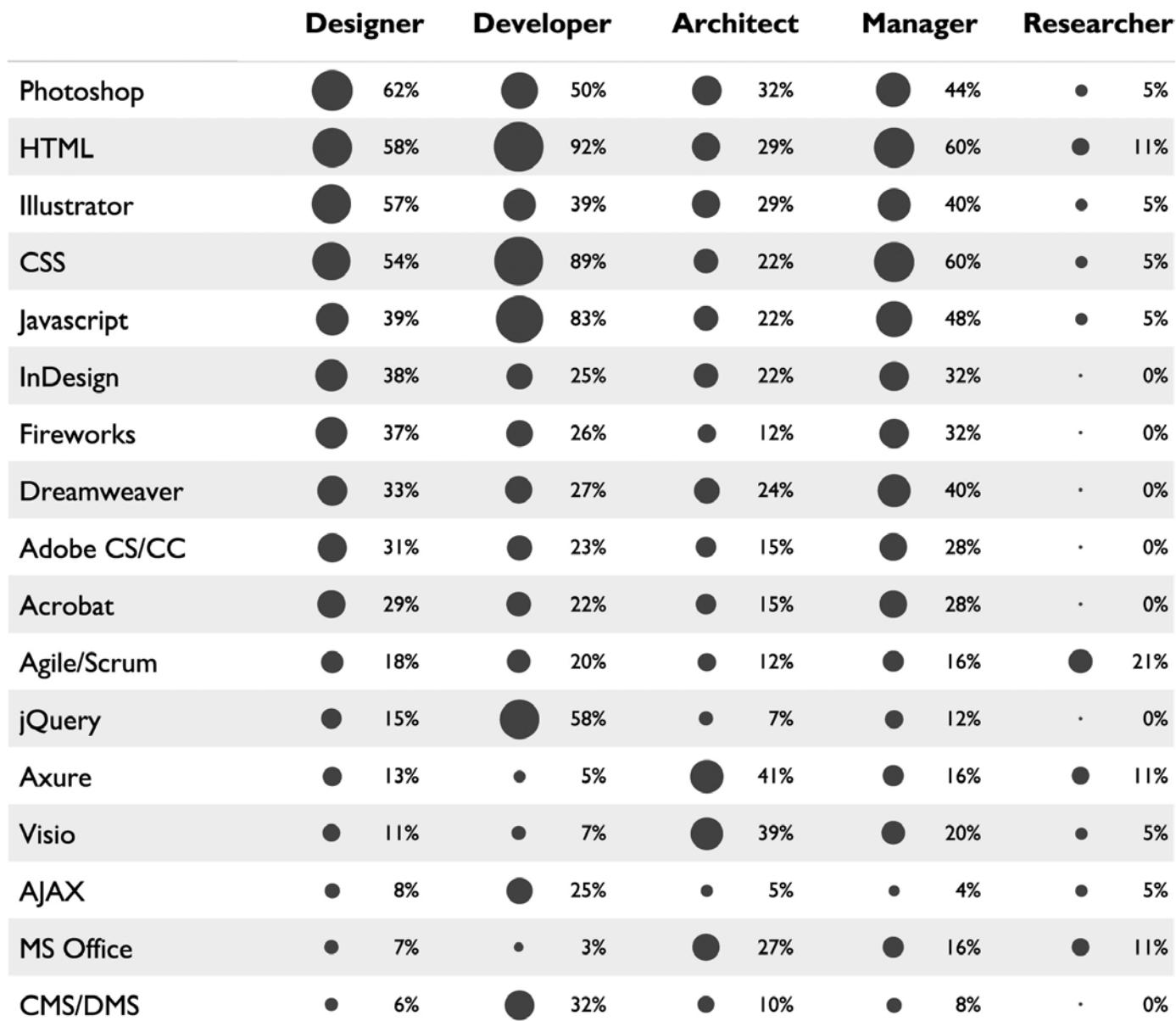


Figure 9. Tools & technologies by job category

As might be expected, the most frequently called-for technologies across all UX positions were HTML, CSS, Photoshop, Illustrator, and JavaScript, with the remainder of the Adobe CS suite following those. Designer and Manager positions followed this pattern. The Developer jobs were by far the most technology-heavy in terms of the proportion of jobs that specified familiarity or proficiency with a variety of technologies, including HTML, JavaScript, and CSS, as well as Adobe CS (especially Photoshop and Illustrator). Architect positions were far more likely to ask for familiarity with Axure and Visio, which are wireframing and flowcharting tools, respectively, speaking to the importance of those tasks to the Architect position. The Architect position was also the only position that asked for MS Office in more than 20% of the ads, presumably because Architects produce the highest percentage of specifications and tech docs out of any of the positions. Researchers were asked for almost no familiarity with technology. Generally, researcher ads were much more concerned with identifying the kinds of research and communication responsibilities the job would require.

Professional competencies

Professional competencies—workplace capabilities that are often taught explicitly in academic programs—were another factor on which the job categories varied, although there were clearly competencies that crossed several categories (see Figure 10).

Just as HTML, CSS, and Adobe CS were the top technologies across all UX positions except Researcher, interface design was critical for all positions, except Researcher. Visual communication and styles are high for all categories but especially critical for Designers, Developers, and Managers, who are charged with developing layouts and other graphical material for sites and applications. Responsive design is high across the board, revealing how necessary designing for a wide range of interfaces has become within UX.

UX principles are also high across the board, though slightly less for Developer, presumably because most principles and practices have already been implemented by the time the developer is tasked with building the actual site or application. Interestingly, the UX principles are largely undefined within the jobs data. Ad after ad would ask applicants to have, for example, a “deep and

programs within the package: Photoshop, Illustrator, InDesign, Acrobat, and Dreamweaver.

current knowledge of UX Design principles and best practices,” without further explanation of what those principles might be. This points strongly to there being a shared and consistent understanding of what constitutes UX principles and best practices, a perspective supported by UX professionals such as Cory Lebson, former president of the UX Professionals Association (personal communication, November 16, 2015).

Research, along with usability and testing, prove to be of significant importance across all categories, but especially Researcher, Architect, and Manager. A wide range of research methods was cited in the ads, including focus groups, surveys, interviews, card sorting, contextual inquiry, task analysis, eye-tracking, and field studies. Researchers were responsible for a broad range of competencies other than research and testing, most notably communicating with clients/customers, unspecified communication, and written communication. Oral communication was also more important for Researchers and Managers than for the other categories. This emphasis on communication speaks to the importance of being able to translate the results of research into actionable design recommendations to other UX team members.

With regard to individual categories, it is not surprising that Architect positions were most commonly tasked with information architecture, which largely pertains to the structuring of information and architecting the user flow and experience as a whole.

Ads asked Managers for the greatest array of competencies—virtually all competencies in Figure 9 are important to Manager positions. Managers and, to an even higher extent, Developers, were expected to understand and work with styles—Developers because they would be responsible for the CSS used in the development of sites and applications, and Managers because styles define the overall look of a project, for which Managers are ultimately responsible. Managers also, not surprisingly, had, by far, the highest percentage of jobs that asked for experience with project management.

Personal characteristics

Although there is some variation in personal characteristics called for by the different job types, this is the area in which there is the most consistency across categories (see Figure 11). If there is a single personal characteristic critical to every job type, it is

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collaboration, which was requested in over 60% of the jobs in each category; for Designers, Developers, and Architects, it was the most frequently mentioned characteristic. Independence/Initiative, while less prominent, was requested in at least one-third of the

jobs in every category; this characteristic was especially requested in the Manager and Researcher jobs.

As Figure 11 illustrates, the Designer and Developer categories have very similar patterns, diverging primarily on the relative importance of time management, which



Figure 10. Professional competencies by job category

was substantially more important for Developers, and creativity, which was, not surprisingly, more important for Designers.

Analytical/critical thinking and leadership were crucial in the Architect, Manager, and Researcher positions. For Architects, these two characteristics were equally important (56%) and were second only to collaboration (63%). For Managers, as would be expected, leadership was essential, requested in 88% of the job postings; however, analytical/critical thinking and collaboration were virtually as important (each at 80%). Every job in the Researcher category (100%) requested analytical/critical thinking, presumably because Researchers would be responsible for designing and implementing the most effective methods for investigating and testing the perspectives and actions of

users—the results upon which so much of the UX design would be based. Although leadership was less visible for Researchers, it was still featured in 53% of the jobs.

Problem solving and interpersonal skills figure most prominently in the Manager and Researcher categories, where they are requested in over half of the jobs. In fact, for Researchers, interpersonal skills (68%) were as important as collaboration (68%). Researchers are required to interact with users as well as with UX development team members and other stakeholders, so managing those relationships is paramount.

It is worth noting that the Manager and Researcher positions called for a broader range of personal characteristics than positions in the other categories. That is, while the Designer, Developer, and Architect jobs also called for numerous characteristics, there was a relatively

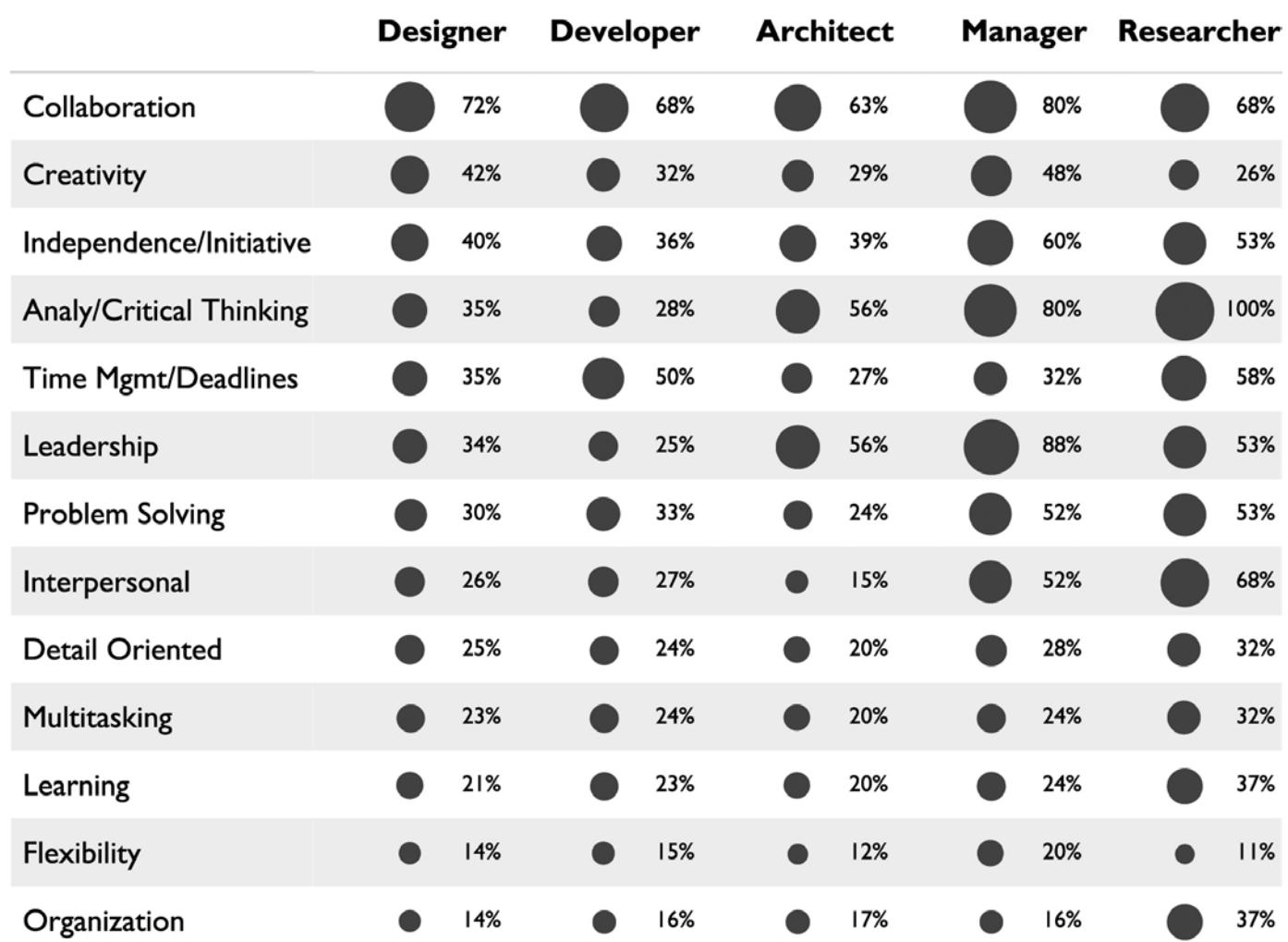


Figure 11. Personal characteristics by job category

Technical Communication as User Experience

clear hierarchy of importance, with a small subset of characteristics that dominated each category. In contrast, the Manager and Researcher jobs gave more equal—and heavier—emphasis to a wider array of characteristics.

Summary

The UX data suggest that each of the job categories has a distinct profile in terms of information products, technology skills, professional competencies, and personal characteristics. Perhaps more importantly, though, the data also reveal competencies and skills that are common across job categories. Several of these are areas that overlap with more traditional technical communication positions, as we discuss in greater depth below.

A Comparison of User Experience and Information Developer Jobs

In this section, we compare the data for UX jobs with our previously reported data for Information Developer (ID) jobs (see Brumberger & Lauer, 2015). ID jobs include more traditional technical writing jobs as well as jobs in areas into which technical communication has expanded—most notably, social media writing and content development/management.

Demographics

The data reveal some notable divergences in UX and ID job demographics. Most striking is the marked difference in salaries, which may, in and of itself, be an incentive for technical communicators to look to transfer their skills into the UX market: UX professionals receive significantly better compensation for their work. On average, the hourly range for UX jobs was \$31–\$58, while the range for ID jobs was about two-thirds that amount, at \$21–\$37/hour. The gap is even larger in annual salaries. UX positions paid an average of \$75,000–\$110,000 per year, not including the manager positions, which capped at \$140,000 per year. The annual range for ID jobs spanned \$45,000 to \$79,000 per year. In short, the lowest salaries for UX jobs were, for the most part, higher than the highest salaries in the technical communication market. The differential in salaries could be due, in some part, to a greater proportion of UX jobs in the Pacific region, which has a higher cost of living. However, this is unlikely to account for all of the salary differences.

A difference in required experience levels may also contribute to UX's higher salaries: Our data revealed

very few entry-level UX positions. Only 3% of the UX jobs required fewer than two years of experience, compared to 13% of the ID jobs. At the same time, there were substantially more senior-level UX jobs: 37% of UX positions called for 5+ years of experience, compared to 29% of ID positions.

Interestingly, the jobs data suggest that education may be viewed somewhat differently by UX and ID employers. Although approximately half the jobs in both areas required a minimum of a bachelor's degree, there were proportionately more UX jobs that did not specify a preferred minimum education level: 45% in comparison to 32% of ID jobs. This may suggest that UX employers place more emphasis on what the applicant can do than on the applicant's education. This emphasis on a candidate's work versus education was also supported by the higher number of UX jobs that specifically asked for a portfolio of a candidate's work. Over one-third of UX jobs (34%) asked for a portfolio, compared to just 3.5% of ID jobs that did so.

Information products

There is very little overlap in products between UX and ID jobs, except for technical documents, which figure prominently in both job types. However, technical documents play a slightly different role in the two areas. For UX jobs, technical documents are largely used to communicate instructions and specifications among team members (e.g., Designer and Developer, Researcher and Architect); they are rarely intended for end-users outside of the company. ID jobs also require the creation of internal specifications and instructions, but many of the technical documents produced in these jobs are developed to be used by an outside client or customer, and such documents are usually in the form of a user guide or help document. Although the majority of products that are commonly mentioned in the UX jobs may not be explicitly requested in ID jobs, some of them—e.g., mockups and wireframes—would certainly be familiar to technical communicators.

Tools and technologies

There is a much greater emphasis on technology in UX jobs than there is in ID jobs. Eleven technologies appeared in 20% or more of the UX job ads while only MS Office appeared in 20% or more of the ID jobs. There are some types of ID jobs (e.g., Content Developer) in which scripting and visual communication

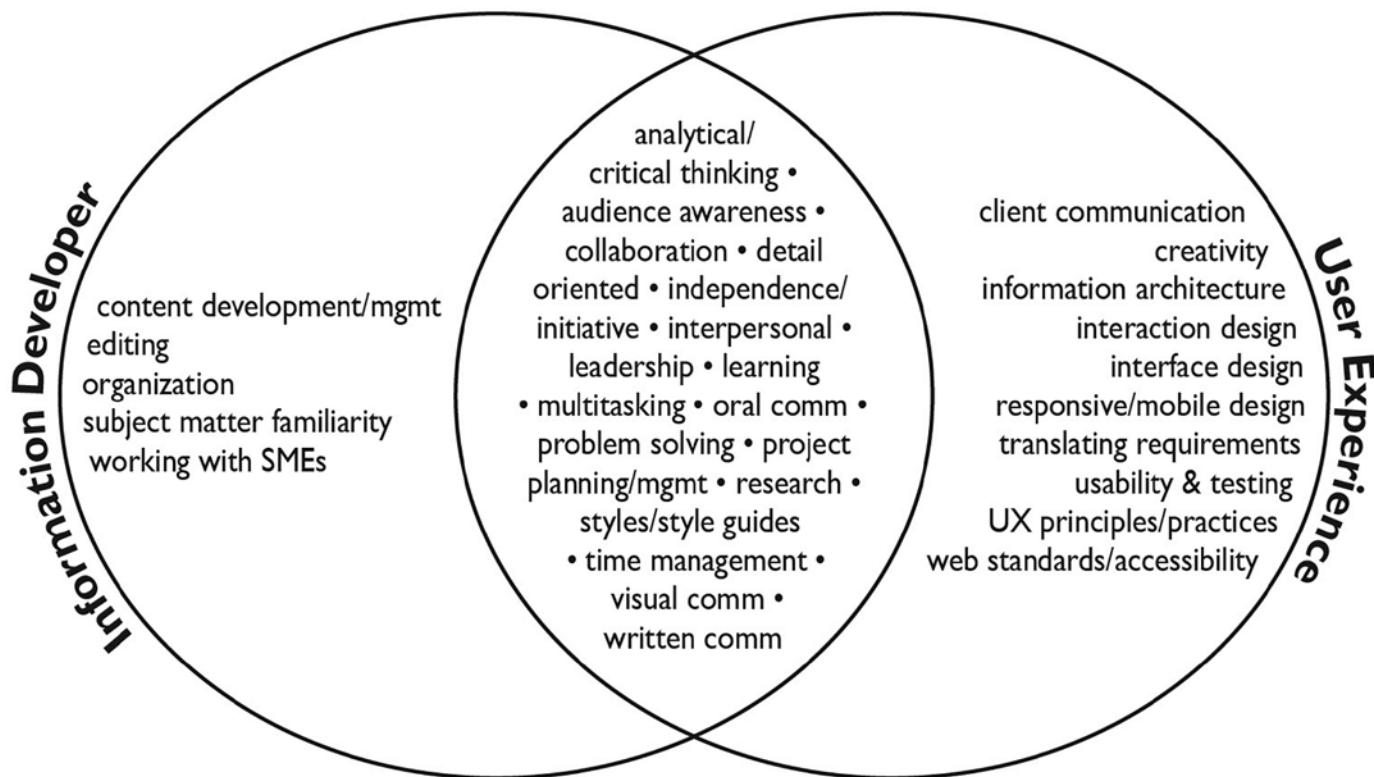


Figure 12. The intersection of technical communication & UX

technologies such as HTML and Adobe CS figure more prominently, but on the whole ID jobs still have much greater emphasis on verbal content than UX jobs. In the case of UX jobs, frequently requested technologies, such as HTML and Adobe CS, are used to help structure and design Web products, which accounts for the pervasive need for familiarity with these technologies.

Competencies and characteristics

UX and ID actually have many more shared competencies and characteristics than they do distinct ones, as illustrated by Figure 12. The competencies and characteristics shown in the intersection of the Venn diagram appeared in least 20% of both UX and ID jobs. Attributes shown on the right were requested in at least 20% of the UX (but not ID) jobs, while those on the left were requested in at least 20% of the ID (but not UX) jobs.

The most important shared competencies and characteristics—that is, those cited in the highest proportion of jobs in both categories—were collaboration, visual communication, and written and oral communication, seconded by analytical/critical thinking, independence/initiative, research, time management, and facility with styles/style guides.

Again, one of the most notable areas in which UX and ID competencies differ is their emphasis on content. All of the ID-only competencies pertain to the development of what is primarily verbal content. Even subject matter familiarity and working with subject matter experts (SMEs) ultimately support the creation of content that is technically accurate. In contrast, the UX-only competencies are directed at creating what one job description referred to as “a blueprint for content”—the underlying design and structure that determine how users will interact with information.

Finally, it is interesting to note that creativity was called for in over one-third (38%) of the UX positions, but does not figure prominently among ID jobs (16%). Conversely, organization was requested in 34% of the ID jobs but only 16% of the UX positions. These numbers may point to a perception, whether true or not, that the work of UX professionals—Designers, in particular—is more free-flowing, innovative work, while the work of technical communicators should be well-ordered.

Summary

Although the UX and ID jobs diverge in the areas of products and technologies, the core competencies and

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personal characteristics identified in the job postings suggest that technical communicators are, overall, well positioned to adopt central roles in UX. This has numerous implications for technical communication practitioners and programs.

Implications

The data show that technical communicators are well-qualified to transfer or expand their skills into UX positions; however, several challenges must be addressed in an effort to ensure the success of this shift. Redish and Barnum (2011) have argued that despite technical communicators' being qualified for UX work, there is a bias that exists against their being part of the UX process. Redish and Barnum note,

The problem may stem from misplaced attitudes or impressions. On the one hand, development teams, including UX specialists, often hold the stereotyped view that technical communicators are merely the ones who write the manuals and sometimes the online help. On the other hand, technical communicators can be complacent about their defined role as doc writers or lack the confidence to fight the stereotype of the box that they are perceived to be in. (p. 97)

To address these issues, technical communicators must think about and articulate their expertise in ways that foreground UX competencies.

Take, for example, employers' perceptions about the importance of creativity to UX jobs. While creative thinking may help a designer differentiate the initial consumer experience of a website or application, it is rhetorical work grounded in user research that drives a user's success with that site or application. Technical communicators specialize in this type of work and need to demonstrate to employers that it, rather than creativity, is at the heart of UX. However, technical communicators should also be prepared to show that creativity plays a role in their rhetorical work, just as it does in the design and development process.

Even more significant are perceptions regarding content as separate from UX. Technical communicators are, of course, well-versed in crafting and developing content. However, if they are going to make the case for a more central role in UX, they have two important arguments to make regarding content. First, they must

articulate to employers their ability to design and structure content in order to facilitate users' interactions with the range of information products, sites, and applications that span the entirety of a brand experience. Additionally, technical communicators must make the argument that, as Baruch Sachs, Senior Director of UX at Pegasystems, says, "The content is critical to the overall experience" (Six, 2015, para. 18). Nevertheless, there exists a perception that content and design are separate entities in the UX process, a perception that is misguided, especially as both designers and communicators must adapt their designs and content to the multiple interfaces and environments in which users interact with it. The user experience is most successful when design and content adapt in tandem and are crafted with shared awareness.

Likewise, the burden rests on practitioners and programs to make hiring managers aware of technical communication whose graduates can perform UX work beyond the development of written content. Technical communication coursework already prepares students to develop visual content and to structure, design, and test interfaces. For example, Meloncon and Henschel (2013) reported that 40% of the 185 undergraduate technical communication programs they reviewed require a course in document/information design, while another 29% offer an document design elective; 45% of the programs required a Web course, and 55% offered it as an elective.

What is much less visible in technical communication curricula are courses in UX and in research methods, both of which would better position new technical communication graduates for UX jobs. Meloncon and Henschel found that just 11% of programs required a course in usability, while only 8% offer a usability elective. Just under one-quarter (23%) required research methods, while 15% offered an elective methods course. The low frequency of these courses may point to the material being integrated across a range of courses within a major. However, to better prepare graduates for careers in both UX and technical communication, programs need to give more attention to these core competencies.

Finally, if programs want to make it easier for technical communication graduates to move into UX, they will introduce more extensive emphasis on tools and technologies such as HTML, JavaScript, CSS, and Adobe CS, even though these technologies are likely already included to some extent in courses that cover Web design and visual communication. For practitioners who are interested in transitioning into UX, it would

be beneficial to acquire additional technology/scripting skills as well and find projects in their workplaces, or ones that can be worked on pro bono, in which they are able to demonstrate the application of UX competencies and technology skills. Such projects should be collected in a portfolio that a practitioner can use to make the case for their skills in UX regardless of their previous employment or education. The work included in a portfolio will provide tangible support for the resume and cover letter in lieu of focusing first on the degree type. The large percentage of jobs in UX that do not specify a minimum education level or experience level creates an opportunity for technical communicators to articulate their skills/abilities rather than degree or formal experience. Even the lack of entry level positions in UX may present an opportunity, in that it allows technical communication students and entry level practitioners to use coursework and early jobs to craft a career direction that will lead into a UX position.

Because a portfolio of work is so often requested in UX job advertisements, it is vital that programs require them as part of a capstone course or final project for students. Students can demonstrate their familiarity with competencies, products, and technologies through course projects and personal work that they include in a portfolio. Many capstone portfolios are intended as an opportunity for students to reflect on how their work has met program outcomes, and thus, the portfolios provide a tool for programmatic assessment. It would be most useful for students, however, these projects instead were crafted to be professional portfolios, where students identify the kinds of jobs they are seeking and articulate how the work they include illustrates their skills and competencies for those jobs. This would in no way diminish the portfolio's worth for assessment purposes; in fact, we contend that it would result in a more authentic representation of student learning. Simultaneously, it would increase the portfolio's value for professional purposes, by allowing students to design their portfolio to meet individual career goals.

Conclusion

As more and more information is mediated exclusively by websites and applications, UX has tremendous growth potential. In a saturated and complex information landscape, UX provides the opportunity

for technical communicators to more broadly apply their strengths as advocates for users. As Redish and Barnum (2011) argue, "Technical communicators are by training and necessity user-centered. . . Their goal is to make even complex interactions understandable and usable" (p. 92). If technical communicators claim a more central role in UX, they will be able to shape the user's experience beyond content and usability, thereby improving interactions with information products at every stage of the process. Bringing with it higher salaries and a multitude of shared competencies with technical communication, UX is both an attractive and a viable career option for technical communicators.

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Review of Four Books on Science

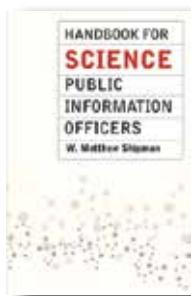
By Diane Martinez

Introduction

Science professionals (scientists, public information officers, science journalists, instructors, and students) can benefit from the technological advancements by learning the nuances of science communication through various delivery systems. This special series review looks at four books that can help readers improve their writing and narrative skills in communicating complex and scientific information to diverse audiences.

Handbook For Science Public Information Officers

W. Matthew Shipman. 2015. Chicago, IL: University of Chicago Press. [ISBN 978-0-226-17946-9. 144 pages, including index. US\$24.95 (softcover).]



Handbook for Science Public Information Officers is an excellent resource for public information officers (PIOs) that covers the many complicated facets of a PIO's position. Novice PIOs will learn how to pitch stories about science and technology, train researchers to give interviews, use social media effectively, handle crisis communication, and meet institutional communication goals. Experienced PIOs may learn new tips, especially in handling online communication—a constantly changing part of their job.

Shipman's writing style is direct and easy to read. I was impressed at how quickly he makes his point, yet he covers topics in a comprehensive manner so that even the least experienced PIO can follow his advice and come off as a seasoned professional. The book's pithy aspect makes it ideal for working professionals who do not have time to pore over lengthy chapters. Students can also learn a great deal about science writing from this book. For instance, before explaining how to write news releases, Shipman covers a very important science communication aspect, how to work with scientists and researchers so that they

agree to share and explain their work with the PIO or other reporters. It does no institution any good to send out news releases to media outlets only to have researchers who avoid reporters or do not know how to talk with them during an interview. In fact, by not preparing researchers to work with media personnel, an institution could suffer bad press because of this poor relationship. Shipman thoroughly explains in this handbook how a PIO can build relationships with researchers to help them see the value of sharing their work with the public.

The guidance on writing news releases, grant announcements, media advisories, op-ed pieces, and news tips is succinct and supported with examples within the chapters and in several appendices. Readers will learn how to write engaging ledes, as well as announcements and stories, about highly technical projects for various key audiences, including audiences outside of the science community. Since a large part of being a PIO is making contact with other reporters who want to write their own news stories, the chapters on pitching stories and using multimedia effectively are vital to understanding important aspects of the PIO's job. It is extremely beneficial to have an entire chapter devoted to using social media effectively in this line of work, and Shipman discusses the advantages of disadvantages of using contemporary social media platforms and how to build a following. Likewise, he provides detailed guidance on writing blog posts and creating story tags. These efforts mean nothing, however, if they do not follow an institution's communication plan, and Shipman explains how to align communication efforts with an institution's goals. He also gives direction on how to collect metrics and re-evaluate plan communication accordingly. One of the worst things about being a PIO is handling bad news, therefore the book ends with details about how to manage bad news and mitigate any further damage.

A quick, but comprehensive, book, *Handbook for Public Information Officers* is highly recommended for working PIOs, journalists, students, and professional writers in science and technology communities.

Review of Four Books on Science

Houston: We Have a Narrative. Why Science Needs Story

Randy Olson. 2015. Chicago, IL: University of Chicago Press. [ISBN 978-0-226-27084-5. 260 pages, including index. US\$20 (softcover).]



Many technical communicators who work with scientists most likely would not argue the position that scientists can improve the way they communicate with non-scientists. Many scientists would probably agree with this statement as well; thus, one of Olson's main points in *Houston: We Have a Narrative. Why Science*

Needs Story that scientists need to learn to communicate their work in more interesting ways is not a new concept. His solution is to let Hollywood show academics how real writing is done; thus, he gives readers his ABT (and, but, therefore) template for storytelling. This model does appear to be one way to write about science in more intriguing ways than simply listing facts.; however, the book is padded with so much superfluous inner dialogue that Olson almost discredits himself and his model.

Olson unveils his Narrative Tools for science writers that includes a word template (The Dobzhansky Template), the sentence template (ABT), and a paragraph template (The Logline Marker Template developed by Dorie Barton). He focuses mostly on ABT, which he claims is a “universal narrative template” (p. 97) and tests it against published articles in several disciplines. These example tests do indicate that the ABT template is a viable way to write about science so that a story evolves versus a static listing of facts.

The ABT template is the only valuable take away from *Houston: We Have a Narrative*, which could be explained in less than a quarter of the pages. One of the most off-putting aspects of Olson's book is his ethos, which is damaged by his sweeping generalizations and rants about academics and Hollywood. He treats the academy, humanities, and Hollywood as monoliths, and uses anecdotal evidence to support the most negative stereotypes. For instance, in the chapter “BUT the humanities are useless for this...” (“this” being teaching students how to write narrative), he stated “what everyone pretty much knows about academia,” is that “The place is a refuge for culturally detached blowhards,

some of whom are good for teaching and research but often limited in their ability to function outside the ivory tower” (p. 57). Such diatribe against the entire academy comes across as grossly personal, inappropriate, and completely unnecessary. Even though Olson sees Hollywood as the supreme solution in teaching people how to write well, he provides scathing stories about the depraved morals of those involved in the entertainment industry—again with sweeping generalization.

Science writing is not a new topic in technical communication (a field which Olson never acknowledges). Ample research and several models within the discipline exist that can elicit similar results to what Olson claims his ABT template will do. For instance, readers may want to consult the many contributions made at the annual Iowa State University Summer Symposium on Science.

Communicate Science Papers, Presentations, and Posters Effectively

Gregory S. Patience, Daria C. Boffito, and Paul A. Patience. 2015. Amsterdam, The Netherlands: Academic Press. [ISBN 978-0-12-801500-1. 285 pages, including index. US\$49.95 (ebook).]



Communicate Science Papers, Presentations, and Posters Effectively offers a straight-forward, comprehensive, and prescriptive approach to teaching about scientific communication to science, technology, engineering, and mathematics (STEM) graduate students, professors, and practitioners. The authors begin with a technical analysis and explanation of the publishing industry and why it is important to publish, how to choose publications that provide authors with the most visibility, and how to increase productivity and the number of people citing a work—all crucial criteria for tenure and promotion. The book also addresses writing style, reporting data in tables and graphs, writing a scientific paper, preparing effective presentations, and writing and designing attention-getting posters.

One strength is the abundant examples in each chapter, especially in demonstrating one writing style over another. For example, in “Writing Style” the authors present helpful comparisons of redundant/

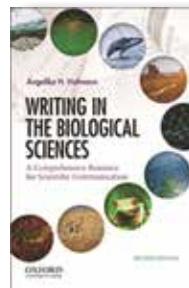
concise wording, vague/precise passages, and passive/active voice that effectively illustrate how to revise scientific writing, which tends to be convoluted and wordy. In “Paper Essentials,” a chapter on how to write sections of a scientific paper, examples include descriptive and assertive titles; long “hanging” titles versus concise, direct titles; passages for the abstract and introduction; and replacing unnecessary phrases with active verbs. Likewise, the chapters that explain graphs and tables provide ample graphical comparisons showing readers how to present numerical data in the clearest manner.

Two other assets of the book are its comprehensive coverage of topics and the helpful exercises. In “Presentations They Will Remember,” the authors explain how to summarize important information, write effective talking points on slides, order slides appropriately, and deliver an intriguing presentation. In addition, they show readers how to create attention-getting graphics that can take the place of wordy slides, with a detailed discussion about color, including mathematical explanations of why some colors are complementary and others are not. Exercises in that same chapter ask readers to apply this information to examples of poor slides and prepare for difficult questions from the audience during a presentation.

The prescriptive approach to writing as presented is direct and helpful; however, it leaves little room for individuality and modifying writing style for different contexts. For instance, in chapter 2, discussions on the use of “we,” and the statement that “quantitative values are better than qualitative statements. Leave boasting for romance novels” (p. 35) are not true in every context. The use of “we” depends on the publication style or style guide, and the use of quantitative or qualitative data depends on the study, as well as the publication. Although the direct writing in *Communicate Science Papers, Presentations, and Posters Effectively* comes across as authoritative and demonstrates a communication approach for which the authors advocate, it might leave some readers with the impression that only one way exists to write and that individuality or individual writing style and voice do not play a role in scientific writing—which is not always true. This prescriptive approach is not a flaw, but it is worth noting given the trend to bring more narrative into scientific writing.

Writing in the Biological Sciences: a Comprehensive Resource for Scientific Communication

Angelika H. Hofmann. 2015. 2nd ed. New York, NY: Oxford University Press. [ISBN 978-0-19-024560-3. 332 pages, including index. US\$27.95 (softcover).]



Writing in the Biological Sciences: A Comprehensive Resource for Scientific Communication holds up to its intended purpose and audience of being a ‘one-stop’ reference guide to scientific communication for budding professionals in the life sciences and other fields” (p. xvii). The part I would emphasize is “other fields,” as this book is relevant for most professionals who compose any type of scientific communication.

Hofmann opens with an explanation of the scientific method and covers a range of issues associated with scientific writing. The result is a four-part practical guide for effectively communicating complex information. “Scientific Writing Basics” is an introduction to style, which approaches writing from a reader-centered standpoint and emphasizes similarities between scientific writing and expository writing, an approach that echoes many composition courses. This familiarity is helpful to students who can build on previous concepts while they learn a new form of writing. Statements about scientific writing being for limited and smaller audiences, however, might be reconsidered as scientific writing permeates mainstream society, especially through blogging, news, and even entertainment. Students in the sciences should be made aware of how public science—and scientific writing—are in today’s society instead of thinking they will be writing mostly to colleagues with similar backgrounds. Within the chapters of this section, Hofmann breaks down the writing basics into simple categories that clearly explain how to choose the right words, structure sentences, and organize paragraphs. Relevant examples accompany every category and clearly demonstrate preferred wording and organization.

“Working with References and Data” is an extremely helpful section for professionals who constantly use outside research and numerical data. For instance, key science databases are included and show students where to find the most recent and relevant information in their fields. They also learn the difference between related

Review of Four Books on Science

and relevant sources and where to place references in a scientific paper. Chapters on statistical data and creating figures and tables introduce students to the basics of statistics (terminology and tests), and the difference between reporting data versus reporting statistical significance. More discussion on ethical issues surrounding the use of statistics and graphical representation of data would be helpful for busy students who may not always pay attention to such details but who need to know the consequences for these unethical practices.

“Introductory Writing” teaches students how to summarize and critique journal articles and compose research and laboratory reports. Document outlines illustrate where information is expected in certain types of documents—details that make a difference in the workplace where busy professionals raid documents for the information they need and expect to find it there. “Advanced Scientific Documents and Presentations” includes chapters on oral presentations, posters, proposals, and job applications as well as provides a cursory introduction to each topic.

Each chapter ends with a helpful summary of concepts and exercises, but teachers are limited on how they can use those exercises because Hofmann includes the answers to most exercises are in the back of the book. As suggested in the Preface, *Writing in the Biological Sciences* will serve students well as either a standalone text for a science writing course or as a supplemental text for a writing-intensive science course.

References

- Hofmann, Angelika H. (2015). *Writing in the Biological Sciences: A Comprehensive Resource for Scientific Communication*, 2nd ed. New York, NY: Oxford University Press. [ISBN 978-0-19-024560-3. 332 pages, including index. US\$27.95 (softcover).]
- Olson, Randy. (2015). *Houston: We Have a Narrative. Why Science Needs Story*. Chicago, IL: University of Chicago Press. [ISBN 978-0-226-27084-5. 260 pages, including index. US\$20 (softcover).]
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- Shipman, W. Matthew. (2015). *Handbook for Science Public Information Officers*. Chicago, IL: University of Chicago Press. [ISBN 978-0-226-17946-9. 144 pages, including index. US\$24.95 (softcover).]

About the Author

Diane Martinez is an assistant professor of professional and technical communication at Western Carolina University. She previously worked as a technical writer in engineering, an online writing instructor, and an online writing center specialist. She has been with STC since 2005.

Table 1: Books on Science

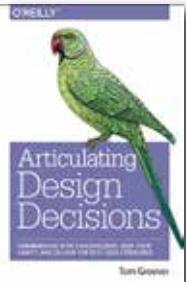
	<i>Handbook for Science Public Information Officers</i>	<i>Houston, We have a Narrative</i>	<i>Communicate Science Papers, Presentations, and Posters Effectively</i>	<i>Writing in the Biological Sciences</i>
Audience	Practicing public information officers (PIOs), experienced and novice	Scientists and science writing professionals	Students, professionals, and academics in science, technology, engineering and mathematics	Life science professionals
Major Strengths	<ul style="list-style-type: none"> Comprehensive guide written in direct style Covers wide range of topics related to PIO's job with helpful examples 	<ul style="list-style-type: none"> Introduces the ABT (and, but, therefore) sentence template 	<ul style="list-style-type: none"> Abundant examples Comprehensive coverage of issues related to publishing Helpful exercises at the end of each chapter 	<ul style="list-style-type: none"> The writing style is easy to read and follow Useful information about the nuances of scientific writing—details that can help students in academic writing and workplace communication
Major Weaknesses	None found	Superfluous information, sweeping generalizations and stereotypes, and personal anecdotes damage writer's ethos and delivery	Prescriptive approach to writing that lacks consideration of context	Some chapters could use expanded ethics discussion
Comments	Highly recommended for working PIOs, journalists, students, and professional writers in science and technology communities	Filled with personal anecdotal evidence Reads more like a stream of consciousness rather than a clearly organized book about writing	Filled with highly technical statistics and data analysis. This is not a drawback but a consideration for prospective readers.	Recommended as a stand-alone text for a scientific writing course or a supplemental text for a science course
Rating	*****	**	****	****
Cost (USD)	\$24.95	\$20	\$49.95 ebook	\$27.95

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Articulating Design Decisions: Communicate with Stakeholders, Keep Your Sanity, and Deliver the Best User Experience

Tom Greever. 2015. Sebastopol, CA: O'Reilly Media. [ISBN 978-1-491-92156-2. 278 pages, including index. US\$34.99 (softcover).]



Articulating Design Decisions: Communicate with Stakeholders, Keep Your Sanity, and Deliver the Best User Experience focuses on educating the reader on how to properly understand stakeholders' perspectives and how to respond to feedback given on design decisions. This book contains thirteen chapters that cover everything from industry information, communication, failure (design) recovery, and ways for nondesigners to understand the process. Greever states that his purpose in writing this book is to help designers become better communicators.

The author frames the book around the idea of design meetings and provides information on what to do before, during, and after these meetings. Greever's concise writing style provides helpful examples and easy-to-understand steps for the reader to follow. He designed his tables with the aim of showing designers how to get "ideal responses" by articulating their design decisions to the stakeholders. *Articulating Design Decisions* provides how to's of preparing and presenting design decisions, ways to understand stakeholders and what they need or want, tactics to present effective responses to stakeholders, and a helpful chapter on how to present to the stakeholders a better understanding of working with designers.

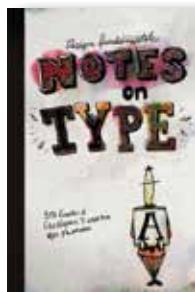
Nondesigners will especially find chapter 12 to be informative. However, experienced designers can also use this chapter to help others within the company better understand design. The book's glossary gives readers a place to easily access new sources and terms. When working on a project, the tables, examples, and glossary allow designers to find better ways of connecting with their stakeholders. I enjoy how Greever provides readers with tips and checklists to understand more about the design process. He breaks the checklists down into design and technical requirements, information, workflow, communication, users, and management. Having access to information like this allows designers and stakeholders to understand more about and invest in the design process.

Kristi Wiley

Kristi Wiley is currently a PhD student in Rhetoric and Writing at Michigan State University. She focuses her research on UX, content strategy, technical writing and editing, usability, and information architecture.

Design Fundamentals: Notes on Type

Rose Gonnella, Christopher J. Navetta, and Max Friedman. 2016. Hoboken, NJ: Pearson education. [ISBN 978-0-13-396242-0. 204 pages, including index. US\$34.99 (softcover).]



Essentially, *Design Fundamentals: Notes on Type* is a textbook complete with a summary at the end of each chapter with exercises and activities. But that does not tell the whole story of this unusual book. It is also a workbook full of a presenter's notes, doodles, and examples—all hand-drawn and colorful. Often, they will get in the way for someone who wants to understand the elements of type and how it fits into the design of a page or screen.

Gonnella and her co-authors divide the material into nine chapters. They begin with a history lesson about how type evolves and the type designers who are responsible. Then, chapters 2–5 present all aspects of type and especially the definitions of various terms associated with type. In chapter 6, they move into type and text with a beginning discussion on designing with type. They go through territory that would be familiar to anyone studying design, such as grids, and discuss and show how aspects of type fit into design.

For students, the heavy use of doodles and drawings to illustrate the points being made, as opposed to photographs found in other books on type, would be a pleasant relief and diversion. And that is where the danger comes for students: They may be too distracted by the art work to concentrate on the fundamentals. But the authors bring them back to reality through the summary, exercises, and activities.

Professional technical communicators may find the art work distracting. They would find the summaries useful even though most run for only one or two paragraphs.

As expected, the text discusses type as type rather than as the letter sound or meaning associated with it: "...naming the terms of type anatomy focuses attention

on shape and form rather than the meaning or content of the words.” And this approach leads to a key point in their book: “Designing requires recognition of type as shape” (p. 67).

When discussing grids in design, the authors make clear that they did not use grids in the book. They rely on the reader to establish the unity of the various elements. *Design Fundamentals* is roughly a single column grid with scattered blocks of printed text surrounded by art. How it all hangs together is another matter and just how are you supposed to read the page is almost impossible to guess most of the time. Yet, it does succeed in conveying a great deal of information about type and its role when designing.

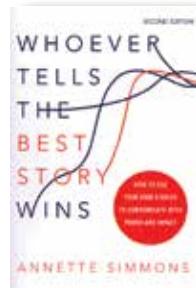
Finally, if you are a student, the difference between this approach and a traditional text has the advantage of the non-conventional. In *Designing Fundamentals: Notes on Type*, you never know what you will encounter when you turn the page. In traditional textbooks, what is on the next page is predictable. So, this book might work well in class. For professional technical communicators, such an eclectic approach may have too many drawbacks when the reader is searching for information on type to support designing a page or screen.

Tom Warren

Tom Warren is an STC Fellow, Jay R. Gould Award for Excellence recipient, and professor emeritus of English (technical writing) at Oklahoma State University, where he established the BA, MA, and PhD technical writing programs. Past president of INTECOM, he served as guest professor at the University of Paderborn, Germany.

Whoever Tells the Best Story Wins: How to Use Your Own Stories to Communicate with Power and Impact

Annette Simmons. 2015. 2nd ed. New York, NY: American Management Association. [ISBN 978-0-8144-4913-4. 234 pages, including index. US\$24.95.]



Where does storytelling fit into the corporate arena? We are familiar with stories used by the advertising industry to create a brand, capture a company’s essence, or to promote a candidate. Simmons suggests that stories can also be used internally to persuade or motivate your staff/team, which is also suitable for training yourself. This works only if the story you tell is personal, puts emotion, and establishes connections first before company benefits.

Telling personal stories teaches storytelling from the “inside out.” It is more than just a plot and characters. A personal story shows a “beating heart” behind the message. The message sent by the storyteller should validate hearers without showing prejudice.

The book’s first part teaches how to gain confidence in storytelling. Simmons recommends that you learn from a mentor skilled in the use of this persuasive technique. She also suggests that you pay attention to stories being told around you. Finally, you must practice. Choose a willing listener who will offer encouragement rather than a critique. Hint: Technical writers are not always the kindest of listeners, because we tend to admire thoroughly crafted works more than a newbie’s attempt.

The second part contains the “meat”—where to find stories to tell. Simmons lists six types of stories: Who-I-Am; Why-I-Am-Here; Teaching; Vision; Value-In-Action; and I-Know-What-You-Are-Thinking. Unless you have previously taken a storytelling course, it’s unlikely you recognize what each type entails or the message it seeks to present. Fortunately, the author provides examples and explains what was taking place in the speaker’s or listeners’ minds. Exercises follow the short tutorial so you can practice each story type.

For example, honestly telling others up front “what is in it for me” is a form of the Why-I-Am-Here story type. No one likes to feel conned. So tell your listeners about a time that you did the right thing even when it was hard to do. Then you can proceed with giving the honest sales pitch you have planned.

Part three of *Whoever Tells the Best Story Wins* teaches methods for perfecting the craft. Adding sensory details can make the listener step inside the story; try the mental exercise of cutting open and biting into a lemon. Using a short story instead of a “preachy litany of positive thinking” allows the listener to come

up with his/her own solution to a problem. Creating collective stories unites people around an organization or candidate. Telling a story from a different point of view than most of your audience holds will produce surprises.

A few final hints. The good listener should be able to retell someone else's story with its message intact. If you think your life story is boring, then you need to tell the truth; everyone has a really good story, which they hide from others.

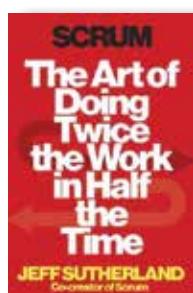
Do tell, because whoever tells the best story wins!

Donna Ford

Donna Ford has been an STC member, joining in 1990 and serving on her local chapter's board for many years. She has been a technical writer since 1987 in the hardware, software, and government healthcare industries. Donna holds a certificate in Information Design from Bentley College. She also reviews books online for the US Review of Books.

Scrum: The Art of Doing Twice the Work in Half the Time

Jeff Sutherland. 2014. New York, NY: Random House Business Books. [ISBN 978-0-34645-0-248 pages, including index. US\$27.00 (softcover).]



Scrum: The Art of Doing Twice the Work in Half the Time educates readers about Scrum's history, philosophy, and value. Sutherland invented Scrum with Ken Schwaber as a framework for improving team productivity. I recommend this book for anyone interested in Scrum or who uses Scrum at work.

Scrum organizes work in Sprints: periods of 1–4 weeks where the team strives to produce something usable by a customer, whether it's a complete product or only part. Scrum philosophy scraps hierarchies and managers replacing them with autonomous teams. Team members are cross-functional. Scrum is not only designed for increasing team productivity but also for increasing team happiness.

The book is part autobiography, part Scrum manual. Sutherland tells stories from his decades of experience in the military, academia, and business. The stories engage the reader and explore Scrum's history. Sutherland

backs up his stories with studies and statistics from the workplace to prove Scrum's efficacy.

Scrum helps you quickly understand the big picture behind it. After framing the context in which Scrum arose and the purpose for Scrum, Sutherland focuses each of the remaining chapters on one aspect of Scrum: teams, time management, wasted work, planning, happiness, priorities, and applications in various industries. Even someone with Scrum experience might gain insight from the book's depth.

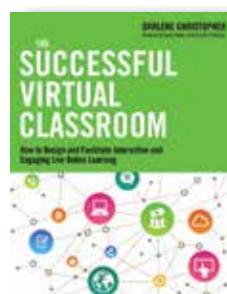
Even if you read *Scrum* and decide not to use it, you can still learn a lot. You can learn how to stay focused on creating value for your customers or clients; how to reduce waste and inefficiency in the workplace; and how to make teams happier. And you'll learn all that while reading engaging stories.

Alex Boren

Alex Boren writes proposals at Geometric. He graduated from the University of Utah in May 2015 with a self-designed, interdisciplinary philosophy degree (BS).

The Successful Virtual Classroom: How to Design and Facilitate Interactive and Engaging Live Online Learning

Darlene Christopher. 2014. New York, NY: AMACOM. [ISBN 978-0-8144-3428-4. 226 pages, including index. US\$39.95 (softcover).]



What can someone say about virtual classrooms today besides reminding folks to avoid death by PowerPoint? Christopher has lots to say on the subject of virtual classrooms, basing conclusions on her experience and citing a number of case studies from groups such as Oracle, UPS, U.S. Army, World Bank, and The Nature Conservancy.

Bringing together groups from various global locations to create a great virtual classroom can be a challenge. Christopher suggests eight techniques to meet the challenge of maximizing participant learning.

- Use the PREP model (Plan, Rehearse, Execute, Post-Session review)
- Use tools, checklists, and worksheets

- Use screen sharing, polls, and breakout rooms
- Bring chat into the classroom
- Monitor feedback
- Use icebreakers
- Encourage audience participation
- Consider your audience's cultural elements

The Successful Virtual Classroom: How to Design and Facilitate Interactive and Engaging Live Online Learning can be a resource for those starting out or those already conducting virtual learning sessions who want to learn more. Christopher also provides practical tips besides sharing the advantages and disadvantages of virtual classrooms. I did not know, for example, that I could get free images from the <https://www.flickr.comcreativecommons/> site.

The author says the ideal situation when setting up your virtual classroom is to think early about scheduling your support staff, such as the producer, facilitator, subject matter expert, instructional designer, administrators, IT support person, and participants.

Christopher includes a table on page 40 that provides questions to consider when learning to use a virtual classroom tool. A few questions from this table are:

- What audio options are available?
- Can I send both public and private chat messages?
- How do I display slides?
- How do I write on the screen or whiteboard?
- What are the maximum number of participants?
- What types of polls are available—multiple choice, multiple answer?
- How do people move in and out of breakout rooms?
- How do I launch the screen sharing feature?

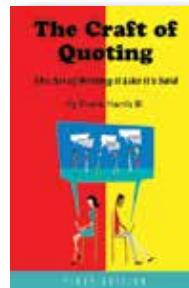
The case studies and tips in *The Successful Virtual Classroom* come from the Christopher's experience as a regional knowledge and learning officer at the World Bank.

Jeanette Evans

Associate Fellow Jeanette Evans is active in the NEO community, currently serving on the newsletter committee. Holding an MS in technical communication management from Mercer University, Jeanette has published in Intercom with articles such as "What We Can Learn from Project Managers" and presented at various STC events, most recently on the topic of emerging technologies in education.

The Craft of Quoting: The Art of Writing it Like it's Said

Frank Harris III. 2015. San Diego, CA: Cognella Academic Publishing. [ISBN 978-1-63189-337-7. 74 pages, including index. US\$52.95 (softcover).]



True confession: This book is not what I thought it would be. I read many things, and when I speak, I often quote from what I have read, so I thought *The Craft of Quoting: The Art of Writing it Like it's Said* would be about how to use quotes when speaking. But this is a book aimed at journalists about how to use quotes in a story.

That being said, I was not disappointed. On the contrary, I learned much about how journalists should use quotes, much of it applicable to technical writers, and some of it applicable to technical writing teachers.

Kudos to Frank Harris III for mentioning technical writers in his Preface, where he includes us among "those who communicate with the written word" (p. vii). His book is full of practical wisdom and is very well-written.

The importance of stories is that they are about people: "...all stories are about people," Harris says, "and in writing, quotes breathe the air of life into your story" (p. 2). Please note that I did not begin that quote with "Harris says." That's something I learned from Harris. It is more effective to place the attribution in the middle of a quote than at the beginning. It improves the sound and the flow.

Technical writers might not think they are writing a story when they interview subject matter experts (SMEs), but they are, in a way. Let's look at the advice that Harris gives on interviewing.

You cannot use "Please" and "Thank You" enough. Understand the power of gatekeepers and treat them with respect. If you have to leave a phone message, speak slowly, enunciate clearly, and repeat your contact information when you end the call. Be early for interviews—Harris says 15 minutes early, in case you can get in earlier with your SME. If you are recording your interview, make sure your smartphone is charged and you have the cord with you just in case.

"Interviewing really boils down to making the source comfortable . . . with the answers and information to your questions" (p. 8). You need to show energy and enthusiasm for your subject matter, and if

you can “mirror” your source, it will build a connection with them. Be a good listener and ask for clarification if you don’t understand something.

Remember that the best interviews are face-to-face. Avoid email interviews, if possible, though Harris adds that celebrity interviews are heading in this direction.

In terms of teaching moments, Harris emphasizes the placement of periods and commas inside quotes and warns against the growing misuse of half-quotes. Both of these are problems for most students.

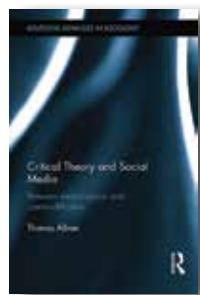
On the critical side, I’m concerned that the high cost of *The Craft of Quoting* will prohibit its use. And given that this is a book on quoting, I’m surprised that Harris does not attribute the source of the quotes he uses throughout the book as graphic design motifs. These things being said, I still appreciate the book very much.

Charles R. Crawley

Charles R. Crawley is a lead technical writer at Rockwell Collins and an adjunct professor at Mount Mercy University, both in Cedar Rapids, Iowa. He is not a journalist and could not play one on TV, but he does appreciate good journalism.

Critical Theory and Social Media: Between Emancipation and Commodification

Thomas Allmer. 2015. New York, NY: Routledge. [ISBN 978-1-138-80876-8. 214 pages, including index. US\$145.00.]



Allmer’s *Critical Theory and Social Media: Between Emancipation and Commodification* is a pioneering study combining critical theoretical and empirical research in the context of digital and social media. This work’s overall aim is discovering the constraints and emancipatory potentials of new media, as well as assessing to what extent digital and social media can strengthen the idea of the “digital commons” and a common-based information society (p. 9). Grounded on Karl Marx’s critical theory and dialectics, this study approaches the main research questions through three parts: analyzing theoretical foundations, presenting a large-scale empirical case study, and suggesting technosocial revolution.

Allmer claims in the first part of his book that in capitalism, technology and media are the “objects of labor and direct forces of production” (p. 42); he also inveighs that capital subsumes the whole society into the production process. Instead of exhibiting the emancipatory potentials, social media and Web 2.0 are essentially “space of capital accumulation” (p. 45) under the control of private corporations to facilitate the commodification processes.

Digital capitalism involves a core question of Internet privacy and surveillance. Adopting the critical political economy approach, Allmer focuses the economic and political issues surrounding Internet privacy and surveillance, and suggests considering the larger societal context of class, ideology, commodity, and exploitation in public discourse. He further points out that the profit-oriented social media, which jeopardize the commons into the logic of capital, produce the antagonism between communicative opportunities and privacy and surveillance threats (p. 97).

Part II of *Critical Theory and Social Media* introduces the empirical research to study users’ knowledge, attitudes, and behavior towards surveillance and privacy of social media. Researchers conduct a survey among Austrian college students (N=3558), asking their perceived advantages and disadvantages of social networking sites. Research results show that economic surveillance (for example, personal profile data accessed by employers, commercial selling of personal data, and receiving spam) is a main social media threat, but only 4.9% of the participants are aware of its commodification.

The quantitative data analysis and research results support Allmer’s argument that corporate social media, the space of capital accumulation, serves as ideological platforms to facilitate commodification. He also points out that the leading public discourse that social media are new, open, and bring about more democracy is a pseudo-proposition and manipulated by social media owners to strengthen their ideological agenda. The new social media users, in contrast, are a spatially and socially fragmented class and are not able to challenge the asymmetrical and hierarchical client-server network. Allmer proposes the peer-to-peer computer network, which has information and communication commons, to be the substitute and the gateway to real social media and human liberation. *Critical Theory and Social Media* is a valuable model for scholars in media and communication studies, digital

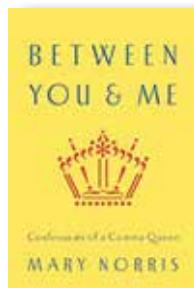
society studies, and beyond to reconsider the problem of emancipation and control.

Lin Dong

Lin Dong is a PhD candidate in Rhetoric and Composition in Georgia State University. She has broad research interests in cross-cultural and international rhetoric and communication, especially in technical and professional communication in global contexts. She is currently writing her PhD dissertation on international crisis communication from a sociotechnical aspect.

Between You & Me: Confessions of a Comma Queen

Mary Norris. 2015. New York, NY: W.W. Norton & Company, Inc. [ISBN 978-0-393-35214-6. 228 pages, including index. US\$15.95 (softcover).]



Between You & Me: Confessions of a Comma Queen is not like any grammar book I've ever read; and I enjoyed it more than any grammar book I've ever read. Norris has cleverly folded her advice into entertaining, and often very funny, stories of her experiences working at *The New Yorker*. As readers might surmise, "comma queen" is Norris' cheeky version of her job title. "Query-proofread" is a more exact description of what she does in preparing pieces for the magazine. Despite her decades on the job, Norris claims that "everybody makes mistakes" (p. 12) and confesses she has a "need to visit the grammatical equivalent of a chiropractor" (p. 13) regularly. This book is "for all of you who want to feel better about your grammar" (p. 14).

It's not just the humor that makes *Between You & Me* so enjoyable for me. Somehow Norris has managed to single out just those knotty problems that I, and probably many other readers, still grapple with sometimes: whether to use "who" or "whom," how to decide if it's between "you and me" or between "you and I," when to hyphenate, or how to fix dangling participles. Drawing on examples from such diverse areas as literature, pop culture, the Internet, auto mechanics, plumbing, Brazilian soccer, and the history of dictionaries, Norris illustrates how she and her

cohorts have worked through grammar questions to reach the conclusions she wants to pass on to readers.

Each chapter of *Between You & Me* delves into a different topic. Some are to be expected—spelling, punctuation, parts of speech. To brush up on these, you can pick out a chapter, but you won't find bullet points. Norris embeds advice within the narrative. Two chapters cover subject matter outside the realm of many English language advice books. One addresses workarounds for the lack of a gender-neutral third-person-singular pronoun in the English language (he/she). The other tackles profanity in print.

Norris ends *Between You & Me* with a chapter about her love of pencils, which endeared the book to me even more, because of the tactile satisfaction writing with pencils provides me. Her description of the history, lore, and technology of pencils and pencil-making was a revelation.

At first glance, this book may seem to trivialize the study of grammar because of Norris' irreverent attitude. But she is deeply serious, not only about the English language and its proper usage, but about her quest to help readers understand how the language works and use it more appropriately. To that end, Norris adds a bibliography of other helpful books.

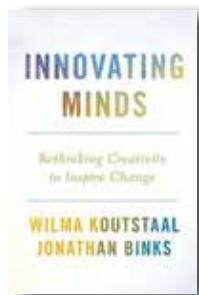
If you're an editor, a fan of *The New Yorker*, want to review some fine points of grammar, or just enjoy a good read and a good laugh, *Between You & Me* is the book for you. I recommend it.

Linda Davis

Linda M. Davis is an independent communications practitioner in the Los Angeles area. She holds an MA in Communication Management and has specialized in strategic communication planning, publication management, writing, and editing for more than 25 years.

Innovating Minds: Rethinking Creativity to Inspire Change

Wilma Koutstaal and Jonathan T. Binks. 2015. Oxford, England: Oxford University Press. [ISBN-978-0-19-931602-1. 342 pages, including index. US\$34.95.]



People who are in awe of creativity often think great ideas spring full-blown from the minds of geniuses like Athena from the head of Zeus. Luckily, in the real world, it doesn't work that way.

In *Innovating Minds: Rethinking Creativity to Inspire Change*, Koutstaal and Binks show that creativity results

from complex interactions between our minds and our environments (physical, social, and symbolic). Creativity thus follows a profoundly iterative process where ideas lead to actions and discoveries, which lead to further ideas in a "perception-action cycle" (p. 135) of "making, finding, and making once more" (p. xi).

The good news is that there are many things that we can do to foster what the authors call "innovating minds"—minds that continually creatively adapt themselves, flexibly build on what they've learned, help others do the same, and shape environments that sustain and spur innovation (p. ix).

Koutstaal and Binks organize their discussion around a number of major questions and themes, among them:

- What are ideas and where do ideas come from?
- The importance of working on problems from different levels of abstraction.
- The importance of allowing for both spontaneity and deliberateness in the planning process.
- Being aware of and receptive to the interplay of motivation, emotion, and perception, and how they affect your goals.
- Being aware of how your physical, symbolic, and social thinking spaces (including your working tools) spur or hamper your creative insights.

Besides the main text and extensive reference list, *Innovating Minds* includes many breakout sections designed to aid understanding.

- A Concepts Guide at the back of the book briefly defines and discusses key concepts from the text,

and helps the reader with terms of art such as "affordances" or "associative cuing" (p. 252).

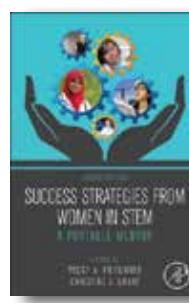
- Thought Boxes describe examples of thinking through a problem, such as the solution to a math problem, or the steps taken by a detective solving a mystery.
- Research Highlights provide summaries of important research on creativity. Many of the findings are very interesting, among them: pairing subjects from diverse multi-cultural backgrounds increases the quality and quantity of ideas generated (pp. 193–194), people who more actively explored their environment at 5 months old showed higher academic performance as 14-year-old teenagers (p. 154), and that when a contest seeking innovative solutions to a difficult genetic sequencing problem was broadly defined and opened to non-expert members of the public, it vastly increased the number and quality of the responses received (pp. 203–205).
- Creativity Cross Checks and Queries provide questions designed to help you connect with the material, think with it, and apply it to your work and practice.

Patrick Lufkin

Patrick Lufkin is an STC Associate Fellow with experience in computer documentation, newsletter production, and public relations. He reads widely in science, history, and current affairs, as well as on writing and editing. He chairs the Gordon Scholarship in technical communication and co-chairs the Northern California technical communication competition.

Success Strategies From Women in STEM: A Portable Mentor

Peggy A. Pritchard and Christine S. Grant, eds. 2015. 2nd edition. London, UK: Elsevier. [ISBN 978-0-12-397181-4. 460 pages, including index. US\$44.95 (softcover).]



For technical or science communicators seeking an updated, comprehensive, and highly detailed set of guidelines and strategies for women in STEM, they need look no further. Pritchard and Grant's compendium addresses the major concerns women have in entering STEM fields, some applicable to men

as well, but most specific to gender-related issues. *Success Strategies From Women in STEM: A Portable Mentor* is presented in a “self-help” format and is eminently readable, with a noticeable and appreciated lack of jargon and business speak.

The articles typically integrate anecdote, quantitative research, case studies, and the writers’ personal experience in developing practical techniques for a panoply of career concerns—networking, mentoring, mental toughness, time management, personal style, surviving and thriving in larger organizations, and communication guidelines, such as specific requirements for communicating science, and using social media effectively.

This latter group of articles is of most interest to technical communicators and science writers. Some material in these sections is universal in application—know and write to your audience; always answer the “So what?” question—the reason your material matters to anyone else; present arguments as narratives, especially when presenting orally; use analogies to explain more arcane scientific concepts; work from the familiar to the unfamiliar; and other established technical communication principles.

Particularly useful, however, is the material about how women communicate and the issues that may arise with it. *Success Strategies From Women in STEM* advises women to avoid apologizing or undermining their position by starting with self-effacing phrases like, “I just wonder if,” “I haven’t researched this much, but,” or “You’ve clearly been studying this longer than I have.” Other self-effacing instances include asking an audience to “just take a minute” to consider their ideas rather than just making a point or recommending an action; asking a question (“What about increasing the budget?”) when the speaker is actually making a statement; and speaking in an unpunctuated flow that ends up exhausting the audience.

These linguistic markers, generally more common among women, can be self-disempowering for the woman uttering them. Similarly, speakers should guard against “uptalk,” the primarily female habit of ending declarative sentences with a rise in inflection, which makes a statement sound like a question, as though the speaker lacks confidence in what she is saying and is seeking approval from the listener.

Pritchard and Grant also discuss how STEM professionals, generally suspicious and distrustful

of social media, can actually use it effectively as a complement, not a replacement, for more traditional ways of sharing research.

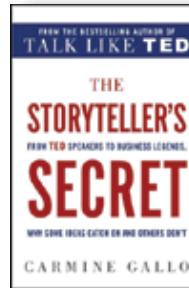
Such information is useful both for women already in the STEM professions and for college women entering the field. Much of it can be used directly in technical communication or career management classes. Overall, a very complete, useful book for all women in STEM professions, loaded with practical, up-to-date career advice and counsel.

Donald R. Riccomini

Donald R. Riccomini is an STC member and a senior lecturer in English at Santa Clara University, where he specializes in teaching engineering and technical communications. He previously spent twenty-three years in high technology as a technical writer, engineer, and manager in semiconductors, instrumentation, and server development.

The Storyteller’s Secret: From TED Speakers to Business Legends, Why Some Ideas Catch On and Others Don’t

Carmine Gallo. 2016. New York, NY: St. Martin’s Press. [ISBN 978-1-250-07155-2. 268 pages, including index. US\$27.99.]



Do you enjoy a great cup of coffee? Think of Starbucks. Do you realize that a driving force behind the success of Starbucks began in 1961 when a young father, Fred Schultz, broke his ankle while working as a diaper service deliveryman? His seven-year-old son, Howard, still remembers the accident. With his father out of work, the family had no income and no health insurance. That incident became the story behind today’s CEO and president of Starbucks, Howard Schultz.

As I read this story of Howard Schultz while thumbing through *The Storyteller’s Secret: From TED Speakers to Business Legends, Why Some Ideas Catch On and Others Don’t* at the local bookstore, I found I was unable to put the book back on the display shelf. I wanted to read more to learn the secret of people like Howard Schultz.

I became aware of some of Schultz' details only recently when we visited Northern Michigan University, Schultz' alma mater, where our son will attend college this year. But, I didn't know the greatness of Starbucks was linked to a young boy's memory of his father.

Stories are what catapult ordinary people into greatness in the world. However, the greatness comes when the story can be told well. Gallo, one of the great teachers of storytelling, has compiled this book of the stories behind the greats. He examines the stories and mines the secret behind each.

Gallo reveals in the Preface that, "Ideas are the currency of the twenty-first century. In the information age, the knowledge economy, you are only as valuable as your ideas" (pp. xv–xvi). Later, he adds, "But an idea can only catch on if the person with the idea can persuade others to take action" (p. 11).

Steve Jobs, whose story is also included, is known as the greatest business storyteller of our time. Jobs stated Apple's core value is "that we believe that people with passion can change the world for the better" (p. 14). Jobs further adds, "Your story begins with your passion. You cannot inspire unless you're inspired yourself" (p. 13).

Great stories introduce three components: villains, heroes, and struggle. As a technical writer, I write stories to include in our documentation and training about how users can use our product to solve their problem situations.

Gallo's *The Storyteller's Secret* is an excellent source of inspiration. He closes the book with The Storyteller's Toolkit, which contains such tools as Secrets at a Glance and The Storyteller's Checklist. It includes such tips as "see the big picture before you dive into the details" (p. 238) and "short words have long-lasting impact" (p. 241).

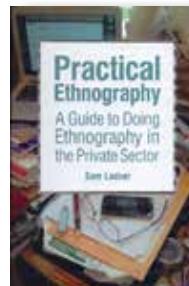
After reading *The Storyteller's Secret*, you can see how these people's lives have impacted our lives today through not only your Starbucks coffee, but the iPhone, iPad, and Pixar's *Toy Story*.

Rhonda Lunemann

Rhonda Lunemann is a technical writer with Siemens PLM Software and a senior member of STC's Twin Cities Chapter.

Practical Ethnography: A Guide to Doing Ethnography in the Private Sector

Sam Ladner. 2014. Walnut Creek, CA: Left Coast Press. [ISBN 978-1-61132-390-0. 212 pages, including index. US\$29.95 (softcover).]



In the 1998 book, *User and Task Analysis for Interface Design*, JoAnn Hackos and I included a short piece on how the field research we were describing draws on ethnographic philosophy and methods. But we stopped short of calling it ethnography because it differs from academic ethnography: We usually spend a day or less with each person. We don't just describe; we use what we learn to help change corporate cultures and build products that may change people's lives.

Ladner does not hesitate to label that type of field research as ethnography. To Ladner, what makes this ethnography is the interaction with people in their own context; the openness of that interaction (a friendly conversation, not a survey or a tightly structured interview); the observations that accompany the conversation; and most importantly seeing the world from the participant's point of view. In the private sector, ethnography requires going beyond description to analysis and interpretation.

"The ethnographic enterprise is to understand people, their beliefs, attitudes, norms, and behaviors" (p. 141).

"The 'so what' question is the most important aspect to ethnography. It is what differentiates ethnography from journalism" (p. 156).

Practical Ethnography: A Guide to Doing Ethnography in the Private Sector is a very practical book. After an introductory chapter and a chapter on the importance of having a theoretical underpinning to your work (and a description of relevant theories), Ladner gets down to specifics about doing ethnography in the type of contexts that we as technical communicators and usability researchers are used to.

Ladner walks us through each stage of a practical ethnography project from planning and budgeting to selecting the team, the tools to use, the people to recruit (and how to find them), doing the actual fieldwork, and then dealing with the masses of data—analysis and

reporting. She has useful suggestions, great tips, and current information for each part of the process. Ladner also shares important insights about managing practical ethnography projects as well as dealing with clients and ethical issues involved in this type of fieldwork.

She contrasts ethnographic philosophy and methods with the often schedule-driven, budget-driven, search-for-“truth”-driven culture of many project managers and market researchers. Ladner describes the dissonance this can cause on both sides and offers practical suggestions for both helping others understand and accept ethnography and adapting ethnographic methods to the constraints of the private sector’s needs.

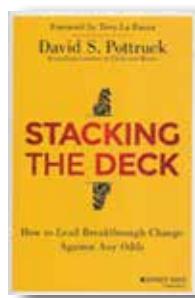
Practical Ethnography is a useful “how-to” guide for those new to ethnographic fieldwork. It is a useful book for those who have met resistance when trying to do this type of research. And it would also be an excellent textbook for technical communication or user experience instructors in a course on fieldwork (especially with the other cited works and the resulting 10 pages of references).

Janice (Ginny) Redish

Janice (Ginny) Redish is President of Redish & Associates in Bethesda, Maryland, USA. Ginny’s “how-to” book, *Letting Go of the Words – Writing Web Content that Works*, (Morgan Kaufmann / Elsevier, 2nd edition, 2012) will help you and your colleagues communicate successfully through your websites and social media. Ginny is an STC Fellow and a former member of the STC Board of Directors.

Stacking the Deck: How to Lead Breakthrough Change Against Any Odds

Davis S. Pottruck. 2014. San Francisco, CA: Jossey-Bass. [ISBN 978-1-118-96688-4. 234 pages, including index. US\$28.00.]



The deck is already stacked against an executive initiating breakthrough change in an organization. Not only are employees resistant to change, but market forces and lack of forward thinking and planning have added challenges at the beginning that can seem insurmountable. Fortunately, Pottruck provides a nine-step process

to help leaders think through the change process and stack the deck in their favor.

He does not sugarcoat the intense amount of work that goes into these steps. Pottruck opens with a harsh dose of reality: “Overcoming emotion (your own and others’), convincing people to follow you, maintaining an extraordinary level of tenacity and resilience, conceptualizing change, and realizing it successfully: these are all tremendously difficult” (p. 10). These steps will make your leadership of breakthrough change more effective. Pottruck provides an action item list at each step to ensure that you have addressed the emotional and social issues tied to change (Steps 1–3) before moving to the actual change plan (Steps 4–9).

Pottruck encourages you not to do this intense work alone, but to do this as a team effort with you and a mentor. He recommends involving people external to the organization—facilitation consultants, speechwriters, customers—to augment your explanation for the change and to help communicate its purpose to your employees. Pottruck also recommends finding employees who embrace change. These pioneers, as he calls them, will help champion your efforts.

Pottruck highlights organizational pitfalls that go beyond helping employees overcome the fear of change. In Step 5, Pottruck notes that corporate resources (budgeting and performance appraisal systems) are not traditionally set up to handle large-scale change efforts. If your performance appraisal system cannot be changed to assess employees in alignment with breakthrough change, the framework starts to erode and trust in the process may start to wane. Thinking through how corporate systems support the change is one step that should come early in the planning process.

Another pitfall is immediately tying change results to organizational profits as the only success measurement. Pottruck cautions that you cannot always measure change through financial results. Because breakthrough change can take time in an organization, focusing on immediate financial results that may not be seen until much later is dangerous. He recommends instead that leaders of breakthrough change communicate interim successes. Showing interim successes helps overcome resistance to the change. It also helps teams maintain stamina throughout the change initiative.

Your perception of a small organizational change can be huge in the mind of your customers, your employees, and your Board of Directors. Stack the deck

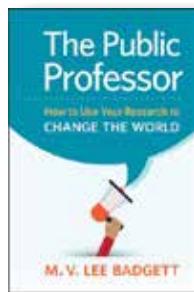
in your favor by reading Pottruck's *Stacking the Deck: How to Lead Breakthrough Change Against Any Odds* and following his practical guidance.

Liz Herman

Liz Herman, PhD, is a knowledge management practitioner who is certified in project management and technical communication. She is a senior member of STC and is active in STC's Washington DC Chapter. She currently works for Battelle in its Health and Consumer Solutions business unit.

The Public Professor: How to Use Your Research to Change the World

M.V. Lee Badgett. 2015. New York, NY: New York University Press. [ISBN 978-1-4798-6139-2. 228 pages, including index. \$24.00 (softcover).]



Reading *The Public Professor: How to Use Your Research to Change the World* brought to mind a quote from negotiating specialist Chester Carras: "The purpose of thought is action." How does this relate to Professor Badgett's book? The author is speaking chiefly to the academic audience: those with that deep

reservoir of learning that manifests itself chiefly as scholarly books and articles on every topic under the sun, including the most pressing problems of today—and tomorrow.

Badgett's thesis is simple: Scholars whose fields deal with those problems—crime and racism, poverty and sexism, inequality and the environment—can make a difference in the world; a "big" difference. But not just by writing about them to fellow-academics; they need to be involved; and that's what this book is about. The subtitle sums it up perfectly: "How to Use Your Research to Change the World." A bit Hollywood, perhaps. But in this case, true as well. The question is "how?"

There are three ways into this thicket that are outside most scholars' comfort zone: (1) seeing the big picture; (2) building the network; and (3) communicating ideas to a different audience.

- **Seeing the Big Picture.** The big picture means understanding what Badgett calls "the terms of the debate and the rules of the game" (p. 1). Most

public issues involve some disagreement: pros and cons, vested interests; many with financial or ideological undertones. As a scholar, you need to understand "all" sides of the argument—the whole debate. Not just the aspect of the argument that your research deals with. And see how your expertise relates to it. You also need to learn how knowledge is packaged and presented in different venues such as courts and legislatures, and among other "influentials" in the public debate.

- **Building a Network.** You need to build a network of relationships outside academia to journalists and community organizations, non-government organizations and unions, policymakers and their staff—all those people, as Badgett puts it, who can "take your ideas into important places that you can't go" (p. 13).

- **Communicating Ideas to Those Outside Your Field.**

Two big challenges occur here. The first challenge is developing the spoken and written language skills to make your ideas not just intelligible, but even interesting and appealing, to the layman. Crucial in any field, but especially in natural sciences or fields using quantitative studies. Think science writing. The second challenge is crossing the generational and digital divides, and embracing media old "and" new: radio and newspapers, blogs and tweets.

Not that hard, really. All it involves is a change of mind and a change of habits. As John Maynard Keynes put it: "When the facts change, I change my mind. What do 'you' do, sir?"

Steven Darian

Steven Darian is an STC Fellow and retired college professor. He also worked as a manager for Raytheon Corporation in Saudi Arabia. Steven's most recent book is "Technique in Nonfiction: The Tools of the Trade" (2016).

Enhancing Learning and Teaching through Student Feedback in Medical and Health Sciences

Chenicheri Sid Nair and Patricie Mertova, eds. 2014. Oxford, UK: Chandos Publishing [ISBN 978-1-84334-752-1. 134 pages, including index. US\$80.00 (softcover).]



Editors Nair and Mertova examine the uses and effectiveness of student feedback in medical classrooms around the world. Their book, *Enhancing Learning and Teaching through Student Feedback in Medical and Health Sciences*, is the third in a series of edited collections covering student feedback in various educational settings.

In much of the Western world, student feedback is used to assess an instructor's effectiveness. Assessment can help determine an academic's fate in everything from tenure decisions to pay raises. As such, "student feedback" has become a loaded term in many academic environments. However, Nair and Mertova argue that open, honest student feedback is essential for improving the quality of academic programs, and that it should become a key part of every medical and health science program. Many areas of the world do not have what Nair and Mertova define as "safe" learning environments," in which students feel free to leave honest feedback (p. xii). By highlighting the use of student feedback and the cultural constraints under which these academic programs operate, the editors hope to create an environment more friendly to student evaluation.

This book offers a snapshot of the novel ways in which instructors worldwide have solicited and addressed student feedback in a variety of classroom settings. The "Using Student Feedback to Enhance Teaching and Learning in an Undergraduate Medical Curriculum" chapter offers an in-depth look at ways that instructors can assess student understanding of material in large classrooms, such as using the iClass application to let students text in real-time feedback to lectures as well as to measure their understanding by soliciting anonymous answers to questions over the lecture. Other chapters cover ways in offering constructive commentary to students, gathering student feedback in a clinical classroom, and developing a system for educational quality management (SEQM).

Perhaps the greatest value of Nair and Mertova's collection lies in the global context in which they discuss student feedback. The authors make several important points about how students from different backgrounds view the role of student feedback. For example, students from Southeast Asia may tend to put the instructor on a pedestal, and therefore be hesitant to offer constructive feedback about the course. These insights are valuable for professors and instructors in technical communication classrooms, many of which have a significant number of pre-medical and Science, Technology, Engineering and Math (STEM) students from these cultures.

Readers should not be put off by the highly specific nature of *Enhancing Learning and Teaching through Student Feedback in Medical and Health Sciences*. Much of the discussion is relevant to instructors in all technical fields, including scientific and technical communication. The classroom and our methods of introducing technical communication concepts are rapidly evolving. To make the most of the changing nature of the type of communication we teach, our methods of gathering and using feedback should evolve as well.

Nicole St. Germaine-Dilts

Nicole St. Germaine is an assistant professor in the Technical and Business Writing Program at Angelo State University, as well as a freelance writer and consultant. Her research interests include technical communication for a Mexican-American audience and technical communication in the health fields.

Current Research on Information Technologies and Society: Papers from the 2013 Meetings of the American Sociological Association

Jennifer Earl and Katrina Kimport, eds. 2015. London, UK: Routledge. [ISBN 978-1-138-80661-0. 136 pages, including index. US\$160.00.]



Digital media have become a significant part of forming and maintaining social groups as well as the exchange of information. This reality has implications for technical communicators, especially in their understanding of their users and the way the design enhances access to the information.

These 8 papers, plus an introductory overview by the editors, examine the social aspects of digital media's use, making them useful as technical communicators formulate the information they want to convey. Each academic paper adds to the understanding of how to make digital media, especially social media, relevant. But be aware that the papers are stylistically academic aimed at sociologists and complete with the usual multitude of references and notes, and are meant to explain social media's role in forming and maintaining social groups. All are, as the subtitle says, from a conference of sociologists sponsored by the American Sociological Association and were originally published in a special issue of *Information, Communication, & Society*.

A key concept found in the papers either directly or indirectly stated, is "social capital." The first paper defines this as "the sum of the resources embedded in the social structure." So, the use of digital media in society becomes part of that capital and aids in bonding as well as bridging social capital. By "bonding," the authors refer to "the resources accessible from one's closest, most homogeneous social relationship" and by "bridging," "those resources most likely accessible from heterogeneous relationships" (p. 9).

Most of the papers focus on users and how they use digital media. These papers are on Internet use in the U.K. (number 3); on Twitter and election results (4); on use of media by emergency agencies (6); on the results of Internet use on personal context (7); on reactions to social media (8); and on Internet use in Canada (9).

The other papers address the collection's overall subject in the introduction; the contributions made to Wikipedia and the rewards offered to contributors. Do they cause an increase in contributions (5)?

Unlike many anthologies of papers from conferences, these first appeared in a journal before being published in book form. This approach means that the editors took time to edit the papers for typos, etc.; so, such problems do not distract the reader. However, the reader must get past the sociology vocabulary and academics, footnotes, and notes to the key points that will be helpful. Another issue for technical communicators is that the papers that report empirical research often use subjects that are not in the demographic group needing technical information. If these research methods will be useful, then this collection has value in spite of its cost.

Tom Warren

Tom Warren is an STC Fellow, Jay R. Gould Award for Excellence recipient, and professor emeritus of English (technical writing) at Oklahoma State University, where he established the BA, MA, and PhD technical writing programs. Past president of INTECOM, he served as guest professor at the University of Paderborn, Germany.

Digital Audiobooks: New Media, Users, and Experiences

Iben Have and Birgitte Stougaard Pedersen. 2016. New York, NY: Routledge. [ISBN 978-1-138-82183-5. 164 pages, including index. \$45.00.]



Digital Audiobooks: New Media, Users, and Experiences is a joy to read. It intersects daily life, listening to audio books, with academic interests and research—technology and educational technology—with research I knew little about: sound studies. The authors accomplish all this while linking their work on audiobooks to rhetoric, literacy, and communications. As such, this book should interest scholars, graduate students, and researchers working in those areas. Additionally, professionals who work with development collections in public or research libraries will likely find *Digital Audiobooks* informative and helpful.

Between the opening and closing chapters that frame the work are the book's three themes: Aesthetics, Sound, Senses; Affordance and Voice; and Usage and Mediatization. Each section is comprised of two chapters with most chapters having less than twenty pages. This makes for a book composed of digestible, engaging chunks that focus on different aspects of audio books. Throughout these three sections, the authors explore the book's two main themes from multiple perspectives. Have and Pedersen ask: can an audiobook be called a book, and is listening to an audiobook reading.

The authors rapidly move past surface information and into substantive explorations with well-referenced citations and understandable definitions for those new to topics like mediatization and the field of sound studies. The writing is concise, accessible, and scholarly. Not surprisingly, Have and Pedersen engage with Ong

and McLuhan throughout the book. This provides access and connections for scholars working more generally with media, composition, and rhetoric. Have and Pedersen's presentation and discussion of intersensorial situations in Chapter 2 is fascinating.

As a reader and researcher, as well as an educator working with graduate students, *Digital Audiobooks* offers a great model. First, the authors employ multiple approaches to research, including evaluating audio book readership based on commercial surveys as well as small, intimate interviews with individual audio book users. Second, Have and Pederson explore the topic of audio books through multiple lenses, including post-phenomenology and sound studies. Third, they engage with the multiplicities of texts and question definitions of reading, listening, and what makes for a book. The writing is collegial. Academic references and scholarship that assumes understanding without cliquish reliance on specialist vocabulary or moves to exclude non-specialists. Finally is Have and Pederson's clear enthusiasm for the subject. It's infectious.

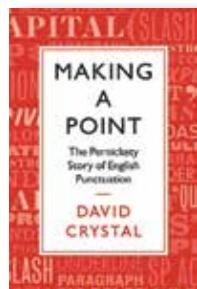
For educators, *Digital Audiobooks* is not only an engaging read—the accessible and portable chapters easily connect to multiple courses regarding communications, rhetoric, accessibility, sound studies, interpreting, and caption studies. Have and Pederson provide an excellent model for graduate students learning to research, write, and publish.

Gregory Zobel

Gregory Zobel is an assistant professor of Educational Technology at Western Oregon University.

Making a Point: The Persnickety Story of English Punctuation

David Crystal. 2015. New York, NY: St. Martin's Press. [ISBN 978-1-250-06041-9. 378 pages, including index. US\$24.99.]



I once wrote a blog for my STC chapter in which I asked myself the question, Why do I care so much about punctuation? Is it because I see it as the main problem of the students where I teach? Is it because the Internet is changing it so much, as well as texting and messaging?

David Crystal suggests this: "Perhaps that is why we care so much about punctuation: we are aware that its character is shifting and unpredictable, that it doesn't offer the same level of order and correctness that is seen in spelling and grammar, and it disturbs us" (p. 344).

Crystal, the author of several popular but scholarly books on English, gives us the kind of book that we as technical communicators so desperately need to guide us in our everyday writing and reading. He provides several chapters on the history of punctuation in an entertaining way, complete with "interludes" that literally illustrate what he is talking about. And he does so using examples from writers such as Shakespeare, Dickens, and Twain. I think this is the strongest, most enjoyable part of his book.

Following his chapters on the development of punctuation in English, Crystal goes into the usage of each punctuation mark, including the period, the ellipsis, exclamation points, questions marks, the semicolon (my favorite), colons, commas, hyphens, apostrophes, and brackets.

Crystal starts by examining how punctuation developed along phonetic versus grammatical points of view. Punctuation first came about to help people read better (elocution and rhetoric), and then came the grammatical position, which was to help people understand what they were reading (meaning and grammar).

From there Crystal goes on to elaborate his particular position on punctuation, which is combination of semantics and pragmatics. "Meaning is the subject-matter of 'semantics,' which is why a 'semantic' approach to punctuation is important" (p. 87). "Pragmatics is a particularly important perspective because it focuses on 'explaining' rather than simply describing usage" (p. 88). Semantics makes arguments based on legibility ("It's easier to read") and clarity ("It reinforces the link between the heading and what follows"), while pragmatics focuses on aesthetics ("It looks nicer") and tradition ("It's always been done that way"). When semantics and pragmatics are at loggerheads, Crystal always prefers pragmatism.

Making a Point: The Persnickety Story of English Punctuation was originally published in Great Britain, and Crystal is English, so the punctuation system he uses is the British style. This means that he uses single quotes instead of double quotes and that his punctuation marks go inside periods instead of outside them. This annoyed me at first, but Crystal explains this usage and shows us

where the differences between the English and American systems come from: Horace Hart's *Rules for Oxford University Press*, published in 1893.

Charles R. Crawley

Charles R. Crawley is a technical writer at Rockwell Collins in Cedar Rapids, Iowa, who also teaches at Mount Mercy University. Punctuation is one of his passions.

Web Content Management: Systems, Features, and Best Practices

Deane Barker. 2016. Sebastopol, CA: O'Reilly Media. [ISBN 978-1-491-90812-9. 352 pages, including index. US\$39.99 (softcover).]



Systems, Features, and Best Practices, contains an accessible, in-depth introduction to the WCMS landscape. You'll find tips for choosing the WCMS that fits your needs. The book's depth also benefits those who already know the basics.

While the book helps you choose a WCMS, it does not list popular WCMSs and their features. Barker mentions common WCMS features and recommends what to consider and compare when selecting a WCMS, but doesn't tell you why (or if) you should choose SiteCore over Drupal. Instead, his discussion is more general: the reasons for choosing a proprietary WCMS versus open source, and vice versa.

That said, Barker gives you all the information you need to make an informed decision. He splits the book into three parts: "The Basics," "The Components of Content Management Systems," and "Implementations." In "The Basics," Barker defines content management, lists points of comparison between WCMSs, points out what to consider when acquiring a WCMS, and discusses the roles in a typical

content management team. This part is for you if you're new to Web content management.

In the second part, Barker gets technical. The initial chapter includes practical recommendations of what to consider when evaluating various WCMSs. The next four chapters discuss core functionality: content modeling, content aggregation, editorial tools and workflow, and output and publication management. The remaining chapters talk about other features of WCMSs and the role of application program interfaces (APIs). While this part might feel too technical for a reader seeking quick tips, the diligent readers will be rewarded. Barker discusses the concepts of Web content management with clarity and precision. You'll gain a solid understanding of the problems WCMSs solve and the various ways they solve them.

Once you choose a WCMS, you'll use it to build and implement a website. In the book's last part, Barker explains the types of implementations and advises you on what qualities to seek (and avoid) in an implementation partner. His depth of experience shines through in this part. Barker ends the book with predictions of where the WCMS market is headed.

Throughout the book, Barker includes short "Perspectives"—one-page opinions written by experts in Web content management. I found their insights useful and interesting. Pay close attention to these Perspectives if you're trying to select a WCMS.

If you're looking for an accessible, in-depth introduction to Web content management, look no further. *Web Content Management* will improve your understanding of the field and sharpen your ability to choose the right WCMS.

Alex Boren

Alex Boren writes proposals at Geometric. He graduated from the University of Utah in May 2015 with a self-designed, interdisciplinary philosophy degree (BS).

Color for Designers: Ninety-five things you need to know when choosing and using colors for layouts and illustrations

Jim Krause. 2015. Upper Saddle River, NJ: New Riders. [ISBN 978-0-321-96814-2. 240 pages, including index. US\$39.99 (softcover).]



Color for Designers describes everything you need to know about color. I find the subject of coloration overwhelming, but Krause groups content into manageable topics that technical writers can find easy to read.

The author divides the 95 topics into 13 chapters. Chapter 1 describes the basics of color, including primary, secondary, and tertiary colors. Chapter 2 adds depth to our color knowledge by explaining hue, saturation, and value. Detail about color relationships, palettes, and neutrals follow in subsequent topics and chapters.

By the time I read half of the book, I felt immersed in knowledge, but not overwhelmed. I started to understand how I, someone who lacks visual skill, can use color to give depth and meaning to projects. This lesson came to life in topic 27, “There Are No Bad Colors” (p. 70.) Krause shows how colors that do not work well in one situation work quite well in another scenario. The lesson is great: Make adjustments until you get the colors working for you and your project.

My favorite series of topics (topics 58–62) comes in Chapter 8, “Conveyances.” These topics are the best example of how text and illustration, with the correct coloration, can explain a lot in a few pages. I left this section feeling very confident that while I am not naturally inclined to communicate with visual elements, I can strengthen my skill in this area by practicing with color. Practice, as Krause explains, aids intellectual understanding and fuels our intuition.

Another great topic that you’ll enjoy is topic 64, “Evaluating Competition.” I make a habit of completing a competitive analysis when starting a new technical writing project. Completing a competitive analysis for a visual design project is essential too. This topic explains what to do to ensure you do not miss a step.

If you are going to skip a section and have experience with printing professional materials, you

can skip chapter 12, “Color and Printing.” Any decent printing company should walk you through these steps. If you’re not sure if you’re working with a decent printing company, this chapter describes the type of topics you should have with your printer, including paper quality and quality checks.

The last chapter, chapter 13, “Paint? Paint!”, is great if you want to paint, but if you’re not interested in this topic, skip these seven topics. One possible exception is topic 91, “Brushes and Paper.” I found the information about brushes and paper of interest although I am not planning to buy brushes or paper.

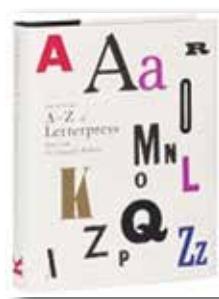
The glossary and index are both useful. My only suggestion is to add more glossary terms. If you’re looking to add a book about visual design to your shelf, this book is a strong choice to consider.

Angela Robertson

Angela Robertson has worked in a variety of technical writing roles with companies like IBM and Red Hat.

Alan Kitching's A–Z of Letterpress: Founts from The Typography Workshop

Alan Kitching, ed. 2015. London, United Kingdom: Laurence King Publishing. [ISBN 978-1-78067-481-0. 272 pages. US\$24.95.]



Alan Kitching's A–Z of Letterpress: Founts from The Typography Workshop showcases the comprehensive, extraordinary wood-letter fount collection of Alan Kitching's Typography Workshop based in Clerkenwell. Founded in 1989, The Typography Workshop houses the biggest collection of Printers' Wooden type in Europe. The book comprises 39 hand-printed letterpress alphabets displayed letter by letter, from A to Z, using founts, many from his own type-specimen books, collected by Kitching with his late partner Celia Stothard, from the 1950s to the present-time. Kitching worked closely with Angus Hyland, a graphic designer and partner in Pentagram's London offices, on the book's execution to use hand-setting letterpress alphabets to commemorate the 25th Anniversary of the Typography Workshop. “All the

founts shown are at the actual size to the real type size. That was a natural element in the design of the book. So the types shown had to be in the smaller sizes to fit the book format." Kitching says, "The main benefit of having this book in one's library, as apposed to other type books, is that you get the whole alphabet of letters of all these founts in the actual type size. From A – Z."

The book's interior pages contain a rich source of typographic images independently printed by hand on a Vandercook no. 3 proof press and a letterpress printed dust jacket showcasing colorful hand-set letterforms inked into the printing surface. Kitching divided the book by full alphabets and numbered from 01–39 according to its fount family name. Typographic jewels of unusual quality—Spartan Solid and Outline, Chatsworth Condensed, and Oriental Solid and Inline—provide the reader with a distinctive collection of uncommon founts. A series of double-page spreads composed of full alphabets from A to Z, such as Latin Old Style, Modern Bold, Windsor Bold Condensed, and Egyptian Bold Extended, separate the individual letter collection. Each chapter letter has been identified in one of four color highlights: Red, Magenta, Royal Blue, and Gold, referring to the master index of its fount family name. John L. Waters, managing editor and co-owner of Eye magazine notes in the introduction, "Each impression, whether you regard it as art, design or living history, is unique" (p. 7).

Alan Kitching's A–Z of Letterpress is a fascinating cultural and historical examination of wood-lettering through the letterpress typographer's lens. The book provides insight and inspiration for everyone who is interested or concerned with typography and graphic communications. This must-have book unveils Kitching's inventive style through imaginative and unusual use of wood letterforms for modern visual communication forms. From beginning to end, Kitching and Hyland have laid out a beautiful design system that flows in a free, harmonious manner revealing lettering styles and constructing a rare jewel of typographic art.

Richard Doubleday

Richard B. Doubleday is an associate professor in the Department of Graphic Design at Louisiana State University's School of Art. He is a contributing author of Phaidon Archive of Graphic Design and Meggs' History of Graphic Design. Richard has been published in Baseline, IDEA, Print, NOVUM, Zhuangshi, and Australian Creative.

Managing Scientific Information and Research Data

Svetla Baykoucheva. 2015. Amsterdam, The Netherlands: Chandos Publishing. [ISBN 978-0-08-100195-0. 150 pages, including index. US\$78.95 (softcover).]



Even though the title and contents of *Managing Scientific Information and Research Data* specify that this book will cover issues associated with "scientific" information and data, students and professionals from many disciplines would benefit from reading this book as information and data management are concerns

for all professionals.

In a conversational, but highly-researched and academic, style of writing, Baykoucheva discusses contemporary information and data concerns for scientists, such as problems with traditional publishing models, open access, peer review, electronic publishing, ethics and biases in publishing, advanced search techniques, big data, measuring academic impact, and social media and altmetrics. Each chapter is a stand-alone publication that accurately problematizes issues in these areas and defines new solutions. For example, challenges of traditional publishing models include biased and faulty peer reviews and movements toward open access; thus, Baykoucheva provides readers with a well-researched and current descriptive list of new publishing models that reduce or eliminate competition and make scientific research more efficient and accessible to more people. Every chapter is well researched and includes timely citations along with easy-to-read, interesting graphics that clearly illustrate wieldy statistics.

The interview chapters are the gems in *Managing Scientific Information and Research Data*. Interspersed throughout the book are five intriguing interviews with scientists and academics who clearly and directly answer questions from Baykoucheva about topics related to the book chapters. For instance, John Fourkas, editor of *The Journal of Physical Chemistry*, gives straight-forward answers about what editors look for in manuscripts, how reviewers are selected, and the consequences for unethical behavior in publishing. The interviews provide breaks between sets of chapters and give the book a more personal, readable feel to it.

This book is intended for scientists, librarians, and “vendors of scientific databases” (p. 5); however, I would extend the readership to both undergraduate and graduate students in the sciences and technical communication programs, along with academics in any field. Baykoucheva is right when she stated that “we should really feel lucky that we are living at a time when so much scientific information is available and so many sophisticated tools allow us to retrieve, refine, and manage it” (p. 7); but all professionals have to be aware of and know how to use those tools, which is exactly what this book offers readers.

Diane Martinez

Diane Martinez is an assistant professor of professional and technical communication at Western Carolina University. She previously worked as a technical writer in engineering, an online writing instructor, and an online writing center specialist. She has been with STC since 2005.

Internet Research Methods

Claire Hewson, Carl Vogel, and Dianna Laurent. 2016. 2nd ed. Los Angeles, CA: Sage Publications Ltd. [ISBN 978–1–4462–0856–4. 222 pages, including index. US\$48.00 (softcover).]



The second edition of *Internet Research Methods* provides seven chapters. Chapter 1 updates Internet developments since the 2002 edition. Chapter 2 explains secondary research methods of Internet information sources, such as databases, archives, electronic texts, online newspapers, Google Scholar, and social media. Chapter 3 reviews and evaluates Internet-mediated research (IMR) methods developed over the last decade. Chapter 4 explores sampling challenges and acknowledges potential biases when conducting IMR. Chapter 5 focuses on IMR ethical issues. Chapter 6 identifies selected IMR technologies and tools. Chapter 7 elaborates on pitfalls and challenges, such as topics associated with equipment, methodologies, netiquette, data scraping (Web data extraction), hackers, and data protection.

The authors bring diverse experience and expertise on Internet-based research. They based *Internet Research*

Methods on their Internet research expertise and experience as well as a literature review of more than 350 international academic journal articles, books, and publications focusing on IMR and related topics. Most references have a 2000 or later publication date and reflect diverse academic disciplines.

Not only does *Internet Research Methods* aptly identify tools, techniques, and resources unique to Internet research, the authors refer readers to selected resources needed to enhance readers’ empirical social science research expertise.

That said, to fully appreciate and understand selected topics, readers inexperienced in social science research methodologies will benefit from further studying empirical social science concepts and methodologies in other sources. For example, one key concept focuses on obtaining generalizable data—obtaining a valid database of the population to investigate, drawing a random sample (in the statistical sense) from it, and then generalizing back to the total population. The authors aptly discuss strategies that cannot provide generalizable findings, but provide useful, but limited, insights into the population or topic being studied.

In Chapter 5, the book discusses challenging ethical issues, such as obtaining consent, confidentiality, participant anonymity, data security, navigating public-private distinction information gathered. Readers should always check with their respective institutional review boards or ethical research committees. Rules, policies, and guidelines vary across countries. What may be allowable in one country may not be allowable in another country.

Chapter 6 provides tables summarizing general principles. For example, Table 6.6 provides guidelines for Web-based surveys including sampling, response rates and drop outs, maximizing data validity, maximizing reliability, and ethical issues. Chapter 7 aptly explores potential problems and pitfalls, such as the more technically complex studies that require greater technological research skills.

Overall, researchers with solid empirical social science research expertise will find *Internet Research Methods* helpful in adding IMR skills to their methodologies and alerting them to unique IMR challenges and pitfalls.

Don Zimmerman

Don Zimmerman is an STC Fellow and Jay R. Gould Award recipient. He taught technical communication classes and conducted research at Colorado State University, Fort Collins. Don's research includes website and interface design; usability testing; health, environmental, science, and technical communication; and technology transfer.

Creating a Website: The Missing Manual

Matthew MacDonald. 2015. Sebastopol, CA: O'Reilly Media Inc. [ISBN 978-1-4919-1807-4. 604 pages, including index. US \$29.99 (softcover).]



Creating a Website: The Missing Manual is indeed the missing manual. Besides covering website design from soup-to-nuts in sixteen chapters, MacDonald loads his book with nuggets of wisdom sprinkled in boxed hints with titles such as "Gem in the Rough," "Up to Speed," "Design Time," and "Word to the Wise." Being generally familiar with the book's content, I found myself focused on reading the boxed items... something I seldom do. I must confess to learning a thing or two that more-savvy technical writers already know. Even then, a few surprising tidbits around HTML5 likely await you.

Chapters 1 through 5 cover the basics to creating pages in HTML. "Webifying Your Text" is the title of one box providing solid hints on Web page design for those new to Web output. And don't we all wish that early on someone provided us with a table listing Special Characters, especially nbsp?

Chapters 6 through 9 assist in moving HTML online to an actual website. I read through the section about Google Web Fonts in case I want to use a copyright-free typeface for marketing my books online. Another section explains how to redirect good links that go bad on an older website. In the chapter on using style sheets, MacDonald promises that with help from his book "you won't break a sweat when it comes time to change something" (p. 203) But should a problem arise, every modern browser provides a CSS inspection tool.

Chapters 10 through 13 cover topics on connecting with the website's proposed audience. Having attended numerous online seminars over the past year on exactly

this topic, I was delighted to find hands-on, low-cost tips that could make my website memorable. Never having bookmarked my Internet home page, I hadn't considered customizing an icon for the bookmark listing. Of course I knew about search engine optimization (SEO), but had not taken the time to figure out how to add keywords in WordPress. Implementing just these two suggestions made MacDonald's book worthwhile reading.

Chapters 14 through 16 make interactive websites, rich with media, seem like a piece of cake. Of course, that isn't fact. However, this guidebook will keep you calm while trying your hand at advanced JavaScript coding or snippets. At the very least, you can troubleshoot like a pro if the video doesn't play as planned.

The Appendix includes a detailed HTML quick reference and an index.

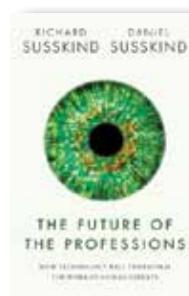
As one expects from any technical book published by O'Reilly, *Creating a Website* is chock full of well-written and useful content. Certain books that I review are passed along to others, but I plan to keep this one for personal reference.

Donna Ford

Donna Ford has been an STC member, joining in 1990 and serving on her local chapter's board for many years. She has been a technical writer since 1987 in the hardware, software, and government healthcare industries. Donna holds a certificate in Information Design from Bentley College. She is the author of three independently published books.

The Future of Professions: How Technology Will Transform the Work of Human Experts

Richard Susskind and Daniel Susskind. 2015. New York, NY: Oxford University Press. [ISBN 978-0-19-871339-5. 346 pages, including index. US\$29.95.]



"What does the future hold in store for my profession? What kinds of changes do I need to *know* about? What new skills will I need if I want to be competitive 5 or 10 years from now?"

These are the kinds of questions that *The Future of the Professions: How Technology Will Transform the Work of Human Experts* spends the next 300 pages wrestling with.

The book is a definitive, well-balanced, and meticulously researched study of technologies that are currently shaping our professions; and next-generation systems and people that will be slowly supplanting and profoundly changing the traditional ways professionals work and how expertise is shared in the future society. Throughout, the authors stress that “the overall trajectory of technological advance is clear and of great importance for the professions—more and more tasks that once required human beings are being performed more productively, cheaply, easily, quickly, and to a higher standard by a range of systems” (p.159). Three major sections of the book address such counterclaims head-on.

Part I reviews the theoretical and historic background underlying the emergence of professions, as well as “the grand bargain” between practitioners and users of professional services. It discusses the common biases toward new technology, explains how these technologies impact the lives of both consumer and provider, and how the systems surreptitiously introduce changes across the professions. The discussion then moves to emerging skills and competencies needed in the future, and new labor models to support different professional fields.

Part II provides a succinct overview of “pre-print,” “print,” and “technology-based societies;” correlating how we store professional expertise and how we share that knowledge in a larger society. The authors focus on technological developments such as information growth; capable machines; ever more pervasive devices; and increasingly connected humans. Additionally, Part II outlines six alternative models of producing and distributing professional expertise that promote greater sharing in society.

Part III is probably the most anticipated and unsettling. The authors address common objections and anxieties that come with new technology. They constantly refocus our attention on the importance of such drastic change. The upside: immediate inexpensive access to expert knowledge, replacing often crippling doctors’ and lawyers’ bills, etc. Part III also makes bold predictions on the growing trend of replacing human specialists with non-thinking machines, and the likelihood of technological unemployment. It also examines “emerging models of sharing expertise” (p.5).

The book’s conclusion provides a certain reassurance: “increasingly capable machines will transform the work of the professional, giving rise to new ways of sharing

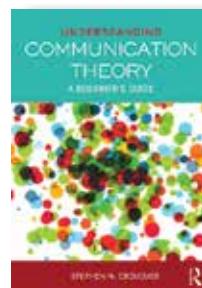
practical expertise in society” (p. 303). But it is up to us to decide how to “use” that technology. The authors urge us, as professionals, policymakers, and consumers, to grasp the issues and get involved in the decisions before those issues are decided for us.

Tetyana Darian

Tetyana Darian is an STC member and graduate student in mathematical computer science. Her interests are in scientific computing, cybersecurity, and artificial intelligence.

Understanding Communication Theory: A Beginner’s Guide

Stephen M. Croucher. 2016. New York, NY: Routledge. [ISBN 978-0-415-74804-9. 366 pages, including index. US\$64.95 (softcover).]



Many years ago, academic technical writing education consisted mainly of training in language and document formats. Little, if any, attention was paid to who would read the material mainly because the reader and writer had similar backgrounds and the variety of technical documents was limited. As recognition of the importance of the user increased, so, too, did academic training broaden to include understanding who would use the materials. As a consequence, courses began involving understanding how communication happens. Such understanding is valuable to technical communicators when analyzing why communications fail or succeed. Now, we find stand-alone courses in communication theory directed specifically to technical communicators or other disciplines. Croucher’s *Understanding Communication Theory: A Beginner’s Guide* is a textbook for general courses. And it, along with many other similar textbooks will need adapting to technical communication situations because so far, no pure technical communication survey of communication theory is available. Croucher’s textbook contains all the trappings of a textbook: Chapter explanations of a theory or group of theories, plenty of descriptive statements directly addressed to the student about the chapter, chapter outlines and conclusions, exercises, discussion questions,

etc. Other textbook features include case studies and sample student papers.

The author divides the book into two major sections: Part I discusses approaches to theory (chapters 1–4), and Part II discusses theoretical contexts (chapters 5–13).

In Part I, Croucher identifies three theoretical paradigms: Social Scientific, Interpretative that includes rationalism and subjectivity, and Critical including Marxism and post-modernism. The theoretical contexts include Interpersonal, Organizational, Inter-Cultural, and Small groups, among others and of most interest to technical communicators. Other contexts include health communication, mass communication, persuasion, rhetorical theory, and critical cultural theory.

One item Croucher discusses that might give pause to a reader is that he lists communication organizations (pp. 12–13), but does not list any technical communication organizations such as STC, IEEE-PCS, ATTW, CPTSC, etc. So, it is unlikely that he knows about technical communication and the role communication theory plays in it. Further, Croucher selects a limited approach to communication—the paradigm—and wants to fit the theories discussed into it. Seen from a more general perspective, there are many ways to organize the theories of communication—see Littlejohn's *Theories of Human Communication*. Croucher is not especially clear on why he selected the approaches he did.

Technical communicators can gain from *Understanding Communication Theory* by reading selectively in the theoretical contexts. Teachers who include communication theory in their technical communication classes will find this text valuable and worthy of consideration. But, they need to match carefully the level of presentation to not only their students but also their class goals.

Tom Warren

Tom Warren is an STC Fellow, Jay R. Gould Award for Excellence recipient, and professor emeritus of English (technical writing) at Oklahoma State University, where he established the BA, MA, and PhD technical writing programs. Past president of INTECOM, he served as guest professor at the University of Paderborn, Germany.

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Lyn Gattis, Editor

The following articles on technical communication have appeared recently in other journals. The abstracts are prepared by volunteer journal monitors. If you would like to contribute, contact Lyn Gattis at LynGattis@MissouriState.edu.

"Recent & Relevant" does not supply copies of cited articles. However, most publishers supply reprints, tear sheets, or copies at nominal cost. Lists of publishers' addresses, covering nearly all the articles we have cited, appear in *Ulrich's international periodicals directory*.

Collaboration

Joining forces across organizational divides

Chambers, H. (2016). *Best Practices*, 18(1), 11–13. [Center for Information-Development Management] [doi: none]

"As anyone who has ever worked in a multinational company can attest, collaboration across functional divides can be fraught with politics and bureaucracy. Even the best of intentions or the highest level of sponsorship won't bring the expected results unless some key dimensions are in place. . ." In this sample case, the author describes a collaborative effort "between two very different teams, one from Marketing and the other from Consumer Support." Over time, "positive social interaction" between the two teams ultimately built the trust necessary for the teams to "come together and work towards a common goal. . . [O]ne should never underestimate the power of inclusion and how important it is for people to be heard in any team effort."

Lyn Gattis

Team communication platforms and emergent social collaboration practices

Anders, A. (2016). *International Journal of Business Communication*, 53(2), 224–261. doi: 10.1177/2329488415627273

"Team communication platforms (TCPs), including the Slack software service, are an emergent class of social collaboration technology that combine features of multiple enterprise social media including social networking platforms and instant messaging. The media capabilities of these platforms, including integrations for

diverse information and communication technologies, enable affordances for both highly adaptable and centralized team communication practices. In order to understand emergent practices in TCPs, this study offers a quantitative and qualitative content analysis of the reflective practice of early adopter organizations and individuals based on a sample of self-published blog posts. Results indicate that TCPs enable affordances for communication visibility that support situated knowledge sharing and collaborative workflows. TCPs also enable affordances for multicomunication and attention allocation including flexible scaling of media modality and synchronicity. This latter affordance is conceptualized as polysynchronicity, a term that describes the dynamic synchronicity characteristic of communication practices in TCP."

Katherine Wertz

Communication

Constructing organizational identity on internal social media: A case study of coworker communication in Jyske Bank

Madsen, V. T. (2016). *International Journal of Business Communication*, 53(2), 200–223. doi: 10.1177/2329488415627272

"This study explored how coworkers use internal social media (ISM) to contribute to the construction of organizational identity. The study analyzed 3 months of interactions among coworkers at a large Danish bank on ISM. In addition, 17 coworkers were interviewed to provide additional understanding about the online interactions. The study found that these

coworkers constructed organizational identity when they challenge, negotiate, and discuss organizational issues on ISM. They use phrases from vision and mission statements to support their arguments and to push the understanding of organizational identity so that it is in line with their perceptions of what the bank really is or should be. Some of these discussions on ISM develop into organizational stories, which are shared and discussed in informal, in-person conversations among coworkers. The stories become narratives, which contribute to the organizational identity, help coworkers make sense of the organization, and help them identify with the organization.”

Katherine Wertz

**Crowdsourcing strategizing:
Communication technology affordances
and the communicative constitution
of organizational strategy**

Aten, K., & Thomas, G. (2016). *International Journal of Business Communication*, 53(2), 148–180. doi: 10.1177/2329488415627269

“Disruptive environmental trends are forcing organizations to be more innovative in their approaches to organizational strategy generation. Rather than using a traditional top-down approach, some organizations are turning to open strategizing, which involves a large number of stakeholders who communicate in transparent, virtual environments. This study used a case analysis to explore one organization’s use of crowdsourcing technology in a move from a traditional to an open strategizing approach. Drawing on technology affordance and communicative-as-constitutive perspectives, [the authors] identified individual and collective crowdsourcing technology affordances for strategizing. Subsequently, [the authors] explored how the technology affordances influenced organizational strategizing. Results showed that crowdsourced strategy was constituted as multivoice, divergent, egalitarian, and inclusive.”

Katherine Wertz

Introduction: Communicating reproduction [special issue]

Hopwood, N., Jones, P. M., Kassell, L., & Secord, J. (2015). *Bulletin of the History of Medicine*, 89(3), 379–404. doi: 10.1353/bhm.2015.0064

“Communication should be central to histories of reproduction, because it has structured how people do and do not reproduce. Yet communication has been so pervasive, and so various, that it is often taken for granted and the historical specificities overlooked. Making communication a frame for histories of reproduction can draw a fragmented field together, including by putting the promotion of esoteric ideas on a par with other practical activities. Paying communication close attention can revitalize the history of reproduction over the long term by highlighting continuities as well as the complex connections between new technologies and new approaches. Themes such as the power of storytelling, the claiming and challenging of expertise, and relations between knowledge and ignorance, secrecy and propriety also invite further study.”

Edward A. Malone

Social collaboration in intranets: The impact of social exchange and group norms on internal communication

Uysal, N. (2016). *International Journal of Business Communication*, 53(2), 181–199. doi: 10.1177/2329488415627270

“Employees increasingly interact through social networking platforms in the workplace. A distinguishing feature of these platforms is their ability to build a sense of community (SOC)—the feelings of membership, influence, integration, and fulfillment of needs, and shared emotional connection. Yet much remains to be understood as to the way these platforms contribute to building a SOC at workplaces. This study examines whether organizational members exhibit community-like behaviors and processes in intranet communication. The study also tests a theoretical model in which members’ perceptions of the group’s norms affect the antecedents of SOC. The results of a survey of 112 employees revealed that both exchanging and observing support increased feelings of SOC. Furthermore, the perception of group norms mediated the relationship between observing and exchanging support and SOC. This study

contributes to the field of business communication by applying a theory-based framework to intranets and empirically testing the role of group norms in shaping online communication behaviors at workplaces.”

Katherine Wertz

Design

Illustrating beauty and utility: Visual rhetoric in two medical texts written in China's Northern Song dynasty, 960–1127

Zhang, Y. (2016). *Journal of Technical Writing and Communication*, 46(2), 172–205. doi: 10.1177/0047281616633599

“This article examines illustrations in two medical texts written in China's Northern Song dynasty. Compared with medical books produced in previous dynasties, these two texts incorporated more illustrations with enhanced beauty and usability. These visual features, [the author] argue[s], carried rhetorical attributes that helped these texts negotiate their way into printing, circulation, and becoming canonical in their own genres. At the same time, they also facilitated efficient and accurate reading through reduced visual clutter and enhanced accuracy and thus appealed to both the elite and the public readership. The article reviews these visual strategies and their implication for technical communication today.”

Anita Ford

Introduction: Beyond illustrations: Doing anatomy with images and objects [special issue]

Berkowitz, C. (2015). *Bulletin of the History of Medicine*, 89(2), 165–170. doi: 10.1353/bhm.2015.0057

“This forum engages with a central component of medical science and medical practice—the visualization of anatomy, pathology, and disease. It is about the collaborations among surgeons, medical men, and anatomists that were necessary to visualization, and about the authority bestowed upon an image or object that stands for a part of the body or a disease,

and also bestowed upon the author of that object or image. It considers aesthetic choices and their social and epistemic contexts and consequences. But it is also about our practices as historians. How do we move beyond thinking of images and objects as simply illustrative? How do we pursue historical inquiry with them? And what are we responsible for conveying about their making and purpose in the images we ourselves display in our books and articles? This introduction provides a brief outline of the themes that structure the three articles collected [in the special issue] and begins to frame answers to such questions.”

Edward A. Malone

Typographic features of text and their contribution to the legibility of academic reading materials: An empirical study

Lonsdale, M. (2016). *Visible Language*, 50(1). [online] [doi: none]

“An experimental study provided evidence that text layout affects performance when reading text to search for specific information under time pressure in an examination-type situation. The present paper reports a second experimental study conducted to ascertain whether this effect extends to similar academic reading materials and situations that, contrary to examinations, are performed under no time pressure. Three layouts were used for comparison, which replicated real-life examination materials and represented three distinct levels of legibility. The results revealed that text layout affects performance under conditions of search reading even when time pressure is absent. Moreover, participants performed better with the layout conforming to legibility guidelines and considered this layout to be the easiest to use and the most attractive. In order to understand these findings, an attempt is made to specify a theoretical model of reading in academic-type situations. The model identifies and analyses the stages of the reading process that might be affected by typographic layout and adopts the hypothesis that such effect takes place at the perceptual level of reading. The outcomes from this study will prove useful to those involved in the development of written materials used in academia such as textbooks, journal articles, magazines, and tests.”

Lyn Gattis

Education

E-book perceptions and use in STEM and non-STEM disciplines: A comparative follow-up study

Carroll, A. J., Corlett-Rivera, K., Hackman, T., & Zou, J. (2016). *Libraries and the Academy*, 16(1), 131–162. doi: 10.1353/pla.2016.0002

“This article describes the results of a survey that gathered data on perceptions and use of e-books from undergraduate students, graduate students, faculty, and staff. The investigators analyzed the results based on user affiliate status and subject discipline and compared the results with the findings of a similar, smaller-scale study conducted in 2012. The study concludes with a discussion of the major findings and their implications for academic libraries and publishers, as well as areas for further inquiry.”

Edward A. Malone

Revising a content-management course for a content strategy world

Gonzales, L., Potts, L., Hart-Davidson, B., & McLeod, M. (2016). *IEEE Transactions on Professional Communication*, 59(1), 56–67. doi: 10.1109/TPC.2016.2537098

“This teaching case describes the evolution of a course on content strategy aimed at advanced undergraduates and graduate students in the digital and professional writing programs at Michigan State University.” Over time, the focus of the course (reflecting changing industry practices) has shifted from writing Web content to single sourcing to enterprise content management systems; the case examines how the course’s current focus on content strategy can “reflect current practices in industry while maintaining grounding for the course in academic research.” The most recent version of the course “specifically addresses three themes identified from the literature—emphasizing the role of the content strategist as an Editor-in-Chief, differentiating the needs of clients and users, and designing for reuse.” The authors conclude, “A course on content strategy that incorporates current industry perspectives helps graduate and undergraduate professional writing

students become more adequately prepared for their future professions working with organizations.”

Rhonda Stanton

Information management

Content strategy—A unifying vision [special issue]

Batova, T., & Andersen, R. (eds). *IEEE Transactions on Professional Communication*, 59(1), 2–6. doi: 10.1109/TPC.2016.2540727

“The papers in this special section focus on effective content strategies. As a unifying vision and action plan, content strategy brings together various specialized writing communities, including professional and technical communication, marketing communication, and web development, ideally breaking disciplinary silos and biases and promoting convergence of these four key dimensions of practice. Component content management, an interdisciplinary area of practice that focuses on creating and managing information as small components rather than documents, has brought significant changes to professional and technical communication work since 2008. One major change is the move toward integrating organizational and user-generated content as well as disciplines and departments, expertise and roles, and business processes and tools. As stakeholders with various backgrounds across organizational units increasingly work together to create and publish content components, they need a unifying approach that fulfills business goals, organization requirements, and user needs. Content strategy has been proposed as that unifying approach.”

Rhonda Stanton

Content strategy: An integrative literature review

Clark, D. (2016). *IEEE Transactions on Professional Communication*, 59(1), 7–23. doi: 10.1109/TPC.2016.2537080

This article examines two research questions: “How is content strategy defined and described in professional and scholarly literature? What do these definitions and

descriptions suggest about the direction of the field of professional and technical communication?" Using classical rhetorical theory as the study's theoretical foundation, the author reviewed peer-reviewed and trade literature on content strategy, including definitions of content and content strategy. Despite some lack of clarity in the definitions, the author finds that "three areas of consensus exist among the definitions" and explains them. "The literature suggests that content strategy provides a pathway to make the work of technical communicators more central to organizations."

Rhonda Stanton

iFixit myself: User-generated content strategy in "The Free Repair Guide for Everything"

Getto, G., & Labriola, J. (2016). *IEEE Transactions on Professional Communication*, 59(1), 37–55. doi: 10.1109/TPC.2016.2527259

"This study investigates the phenomenon of user-generated content strategy in an open-source, wiki-based content-management system (CMS) for the repair of technological devices (<http://ifixit.com>). By 'user-generated content strategy,' [the authors] mean processes for developing systems for producing, moderating, and encouraging user-generated content." The researchers investigated how content is managed and organized in "an open-source, wiki-based content-management system that relies on content generated by a wide variety of users" and also what content rules or logic might "emerge from a qualitative case study of such a CMS." [The authors] "conducted a content audit of iFixit's main educational initiative, the Technical Writing Project (<http://edu.ifixit.com>) to identify strategies iFixit uses to organize content in this initiative." They also "supplemented the audit with interviews with student participants in the project and iFixit technical writing staff to find out what technologies and other affordances affected users of the iFixit Technical Writing Project. . . . Lessons for organizations who wish to encourage user-generated content include developing strategies that protect users from the worst consequences of their actions, that encourage participation, and that allow for experienced users to vet new content."

Rhonda Stanton

International standards for information development and content management

Hackos, J. T. (2016). *IEEE Transactions on Professional Communication*, 59(1), 24–36. doi: 10.1109/TPC.2016.2527278

"Why are standards and standards development important for information development and management?" This article suggests seven key lessons about how to use standards to "manage content development . . . support the development of content . . . review and test information . . . manage agile information development . . . manage the development of documentation . . . select and implement a content-management system . . . [and] hire information developers who understand the importance of using standards." The author concludes that "[s]tandards provide a means for information developers to ensure that they are managing and developing content effectively. Implementing standards in an organization helps to ensure that technology choices made today will not restrict future technology developments."

Rhonda Stanton

Top ten list for content strategy

Berry, M. (2016). *Best Practices*, 18(1), 14–16. [Center for Information-Development Management] [doi: none]

This article offers practical guidelines for understanding "what content strategy really is, and how it works in a technical publication context." The author differentiates between content strategy, which uses content to "achieve a measurable business goal," and information architecture, which is the way content is structured for "maximum reuse, translation, ease-of-navigation . . . and other broad usability goals." The article includes suggestions for using metrics to evaluate "effectiveness of topics or other deliverables," create new strategies, and document successes. The author notes that content issues can also help identify non-content problems the organization should address.

Lyn Gattis

Intercultural issues

Picture this: Developing a model for the analysis of visual metadiscourse

De Groot, E., Nickerson, C., Korzilius, H., & Gerritsen, M. (2016). *Journal of Business and Technical Communication*, 30(2), 165–201. doi: 10.1177/1050651915620235

“Corporate documents increasingly rely on visual rhetoric to complement text. Although previous studies have indicated that companies’ local culture may be reflected in the images they employ, scholars have never systematically investigated the use of visual rhetoric as it is used across different business cultures. This study analyzes visual rhetoric using a new model of visual metadiscourse—a set of devices that designers use to convey meaning in order to influence the audience’s interpretation of the text. The study compares the visual metadiscourse in photos used in English management statements in the annual reports of Dutch and U.K. companies. The results show that metadiscourse is inherent not only in the written text of a corporate document but also in the visuals that a design team chooses to include. The results also indicate that despite some similarities, Dutch-based and U.K.-based statements contain differences in their use of visual metadiscourse. Several of these differences can be attributed to cultural differences between the Netherlands and the United Kingdom. The study underlines the applicability of the new model and warns international text designers not to overlook cultural differences in visual metadiscourse.”

Sean C. Herring

Recognizing appropriate representation of indigenous knowledge in design practice

Kelly, M., & Kennedy, R. (2016). *Visible Language*, 50(1). [online] [doi: none]

“This paper focuses on the need for designers to follow clear, concise, workable practises to engage appropriately and ethically with indigenous knowledge on projects involving the graphical depiction of indigenous culture. Incorporating indigenous symbols into visual communication design strategies impacts

a wide range of stakeholders and therefore requires a sensitive approach with broad consultation in regard to permissions and intellectual property rights; issues can be worked through if respectful practice methods are applied. This paper acknowledges cultural appropriation is not new and that creative, cross cultural interpretation and expressions of hybridity should be encouraged. However, respectful communication, consultation, and collaboration are required whenever commercial application of indigenous culture is attempted. To demonstrate the need for clarity, three case study examples [are] presented, each with design solutions involving the use of graphical depictions of indigenous culture and each selected due to the varying degrees of stakeholder engagement undertaken in the design process. The introduction of the ladder of stakeholder engagement theory is a new concept introduced in this paper that can be employed to better consider the appropriate and ethical engagement of designers with indigenous knowledge.”

Lyn Gattis

“Womb with a view”: The introduction of Western obstetrics in nineteenth-century Siam

Pearson, Q. T. (2016). *Bulletin of the History of Medicine*, 90(1), 1–31. doi: 10.1353/bhm.2016.0005

“This article focuses on the historical confrontation between Western obstetrical medicine and indigenous midwifery in nineteenth-century Siam (Thailand). Beginning with the campaign of medical missionaries to reform Siamese obstetrical care, it explores the types of arguments that were employed in the contest between these two forms of expert knowledge. Missionary–physicians used their anatomical knowledge to contest both particular indigenous obstetrical practices and more generalized notions concerning its moral and metaphysical foundations. At the same time, by appealing to the health and well-being of the consorts and children of the Siamese elite, they gained access to the intimate spaces of Siamese political life.”

Edward A. Malone

The write bias: The influence of native writing direction on aesthetic preference biases

Friedrich, T. E., & Elias, L. J. (2016). *Psychology of Aesthetics, Creativity, and the Arts*, 10(2), 128–133. doi: 10.1037/aca0000055

“Consistent with previous literature examining visuospatial biases of left-to-right and right-to-left readers, the two reading groups in the current experiment demonstrated different preference biases. Similar to previous research examining Western populations, participants whose native language reads from left to right (Hindi) demonstrated a strong preference for stimuli with a left-to-right directionality from the perceivers’ point of view. However, participants whose native language reads from right to left (Urdu) failed to demonstrate a lateral preference bias for all stimuli. . . . [T]he directionality preference observed by both reading groups was independent of the type of object portrayed in the stimuli (i.e., mobile object or landscape) and dependent on the directionality depicted in the image or video. As well, the magnitude of the bias demonstrated by both reading direction groups was larger for the dynamic stimuli compared to static stimuli, suggesting that dynamic stimuli should be used as a tool to magnify the occurrence of lateral biases.”

Edward A. Malone

carry substantial teaching loads; and the majority are satisfied and happy in their present position, but half would prefer to be working on the tenure track.”

Anita Ford

Research

The development and validation of the e-health competency scale: A measurement of self-efficacy, knowledge, usage, and motivation

Britt, R. K., & Hatten, K. N. (2016). *Technical Communication Quarterly*, 25(2), 137–150. doi: 10.1080/10572252.2016.1149621

“The purpose of this study is to construct and validate a scale of electronic health (e-health) communication competence. Based on a comprehensive review of e-health literature, this scale was constructed using two studies to gather data and validate the scale; four dimensions emerged in the final measurement: e-health self-efficacy, knowledge, usage, and motivation. Results suggest the e-health competence scale is useful for researchers to develop online health interventions and other domains of computer-mediated communication.”

Lyn Gattis

Professional issues

A portrait of non-tenure-track faculty in technical and professional communication: Results of a pilot study

Meloncon, L., England, P., & Ilyasova, A. (2016). *Journal of Technical Writing and Communication*, 46(2), 206–235. doi: 10.1177/0047281616633601

“[The authors] report the results of a pilot study that offers the field of technical and professional communication its first look at material working conditions of contingent faculty, such as course loads, compensation, and professional support. Findings include that contingent faculty are more enduring with stable full-time, multi-year contracts; they

Perspectives on uncertainty for technical communication scholars

Walsh, L., & Walker, K. C. (2016). *Technical Communication Quarterly*, 25(2), 71–86. doi: 10.1080/10572252.2016.1150517

“Technical communication scholars have tended to treat uncertainty as a lack of certainty rather than as a diverse range of strategies for talking about risk. This review employs Goodnight’s argument spheres to comprehend treatments of uncertainty in technical communication and closely related fields. The advantages of such an approach are demonstrated via a reanalysis of a recent risk communication study. The review finishes by identifying hybrid forums as productive sites for future research.”

Lyn Gattis

Stasis in space! Viewing definitional conflicts surrounding the James Webb Space Telescope funding debate

Weber, R. (2016). *Technical Communication Quarterly*, 25(2), 87–103. doi: 10.1080/10572252.2016.1149619

“During 2010 and 2011, debate ensued over funding for National Aeronautics and Space Administration’s (NASA) James Webb Space Telescope (JWST). This article uses stasis theory to analyze reports and statements produced by NASA, politicians, and scientists. The analysis reveals that an official report addresses stasis questions and guides further action. Additionally, varying perspectives on the telescope suggest that definitions play a crucial role in technology funding debates. This analysis demonstrates that stasis theory provides a productive tool for analyzing technology policy debates.”

Lyn Gattis

Science writing

Communicating a new consciousness: Countercultural print and the home birth movement in the 1970s

Kline, W. (2015). *Bulletin of the History of Medicine*, 89(3), 527–556. doi: 10.1353/bhm.2015.0065

“This essay analyzes the production of three influential home birth texts of the 1970s written by self-proclaimed lay midwives that helped to fuel and sustain a movement in alternative birth practices. As part of a countercultural lifestyle print culture, early ‘how-to’ books (Raven Lang’s *The Birth Book*, Ina May Gaskin’s *Spiritual Midwifery*) provided readers with vivid images and accounts in stark contrast to those of the sterile hospital delivery room. By the end of the decade, Rahima Baldwin’s more mainstream guidebook, *Special Delivery*, indicated an interest in translating home birth to a wider audience who did not necessarily identify as ‘countercultural.’ Lay midwives who were authors of radical print texts in the 1970s played an important role in reshaping expectations about the birth experience, suggesting a need to rethink how we define the counterculture and its legacies.”

Edward A. Malone

Constructing relationships between science and practice in the written science communication of the Washington State wine industry

Szymanski, E. A. (2016). *Written Communication*, 33(2), 184–215. doi: 10.1177/0741088316631528

“Even as deficit model science communication falls out of favor, few studies question how written science communication constructs relationships between science and industry. Here, [the author] investigate[s] how textual microprocesses relate scientific research to industry practice in the Washington State wine industry, helping (or hindering) winemakers and wine grape growers in making research relevant to their work. Critical discourse analysis of a corpus of wine science texts suggests that textual microprocesses continue to enact a deficit paradigm: scientists as knowledge producers and the industry public as knowledge deficient. Through its extension of features of scientific discourse, the industry-oriented literature abstracts research practices from context which could aid in drawing relationships with industry practices. In aggregate, these texts suggest an opportunity to increase research relevance to industry practice by writing the research–industry relationship differently, recontextualizing research in practice.”

Lyn Gattis

Disruption, spectacle, and gender in eighteenth-century technical communication

Milbourne, C. R. (2016). *Technical Communication Quarterly*, 25(2), 121–136. doi: 10.1080/10572252.2016.1148200

“This article examines how 18th-century technical communicators used spectacular science displays to critique audiences’ existing knowledge and advocate for alternative perspectives and technical practices. In addition to using disruptive rhetorical strategies such as amplification and contrary opposition, historical technical communicators heightened the wonder of their displays by disrupting audience expectations for the extended material and social scenes, including the objects, spaces, bodies, and cultural performances like gender that surrounded the demonstrations.”

Lyn Gattis

Mapping the contours of translation: Visualized un/certainties in the ozone hole controversy

Walker, K. C. (2016). *Technical Communication Quarterly*, 25(2), 104–120. doi: 10.1080/10572252.2016.1149620

“This study of ozone-hole controversy demonstrates an approach to translation that captures material-discursive elements of environmental risk. By adapting actor–network theory’s notion of translation with Goodnight’s spheres of argument model, the author’s results reveal how uncertainties created sites for scientists and their images to perform in ways that visualized risk in public forums. Citizens then responded to these risks through amplified uncertainties and counterimages that envisioned a hole in the skin of the body public.”

Lyn Gattis

Technology

Masculinity and material culture in technological transitions: From letterpress to offset lithography, 1960s–1980s

Stein, J. A. (2016). *Technology and Culture*, 57(1), 24–53. doi: 10.1353/tech.2016.0010

“Between the 1960s and the 1980s the printing industry in advanced capitalist economies underwent dramatic technological change. While the transition from ‘hot metal’ compositing to computerized typesetting has been extensively analyzed, there was another transformation occurring simultaneously: in the pressroom, letterpress was gradually replaced by offset lithography. Many letterpress machinists retrained, moving from a heavy, manual technology (with an entrenched patriarchal culture) to a method that was faster and less physically taxing. However, unlike their compositor counterparts, the press-machinists’ transition involved a continuity of traditional masculine craft identities rather than a rupture associated with ‘deskilling.’ Intrinsic to this experience of technological change was a masculine embodiment that was attuned to and shaped by the materiality and aesthetics of printing technologies. This article establishes how masculine craft identities do not rely exclusively on skill-based mastery of traditional

technologies, but also relate to other dimensions of technology, such as aesthetics, embodied ‘know-how,’ and the physicality of industrial machinery.”

Edward A. Malone

Usability

Usability definitions in a dynamically changing information environment

Chen, Y., Rorissa, A., & Germain, C. A. (2015). *Libraries and the Academy*, 15(4), 601–621. doi: 10.1353/pla.2015.0048

“The authors compared Web usability definitions, collected from library professionals at academic institutions of the Association of Research Libraries (ARL) through online surveys in 2007 and 2012, to determine whether library practitioners’ perspectives had altered as information technologies evolved during this time. The authors applied three techniques of statistical data analysis—t-tests, cluster analyses, and the Mantel test—for comparisons. The results indicated significant increased emphases on the Interface/Design and Effectiveness attributes in the 2012 data set. This increase may be due to the rise in the use of mobile devices for information access, driving practitioners to place a stronger emphasis on these attributes.”

Edward A. Malone

Writing

How magnets attract and repel: Interessement in a technology commercialization competition

Spinuzzi, C., Nelson, S., Thomson, K. S., Lorenzini, F., French, R. A., Pogue, G., & London, N. (2016). *Written Communication*, 33(1), 3–41. doi: 10.1177/0741088315614566

“K6015, a South Korean firm seeking to commercialize its magnet technology in the US market, entered a technology commercialization training program structured as a competition. Through this program,

K6015 (and others in the program) used several genres to progressively interest different sets of stakeholders. To understand how K6015 applied these genres, [the authors] analyze this case study in terms of *interessement*, a concept from actor-network theory, and *standing sets of transformations*, a related concept from workplace writing studies in which enacting a set of genres entails a controlled, progressive transformation of arguments. [The authors] examine the entire competition process, using K6015 and three other competitors to illustrate this process and to examine rhetorical transformations responding to different criteria. In enacting these standing sets of transformations, K6015 and other competitors transformed their innovations into commercialized technologies—and transformed themselves from innovators into entrepreneurs. Finally, [the authors] discuss implications for understanding entrepreneurship rhetorically.”

Lyn Gattis